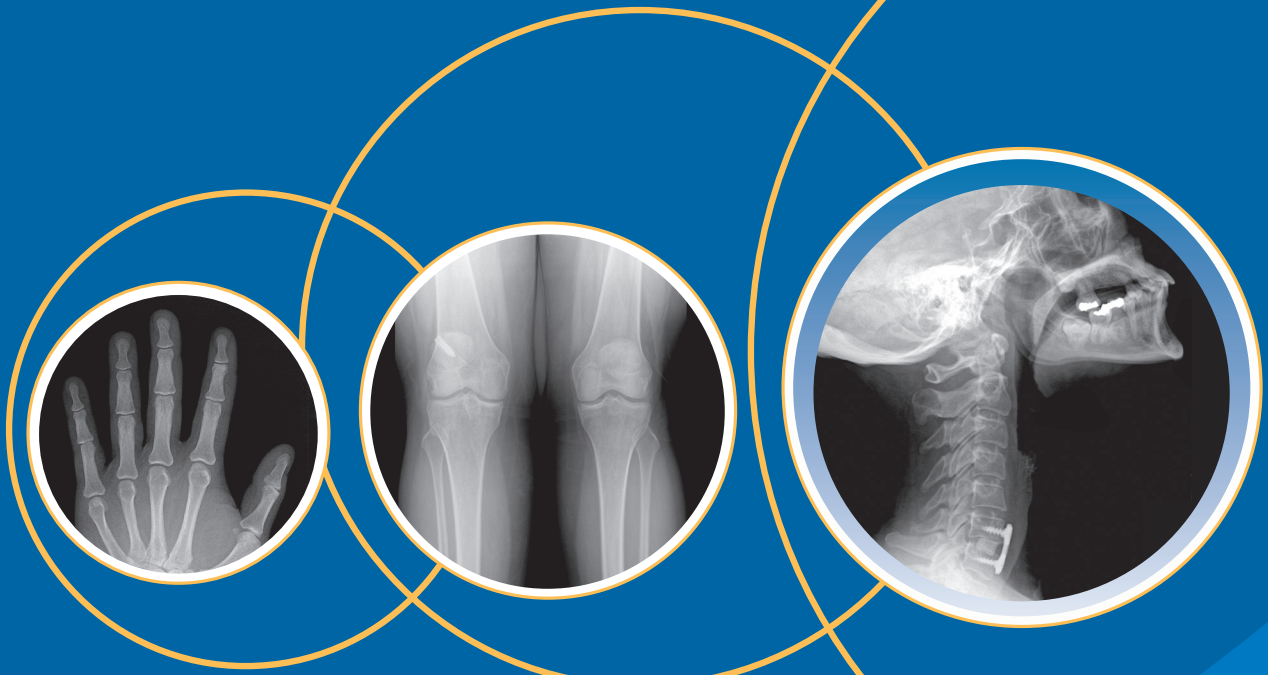
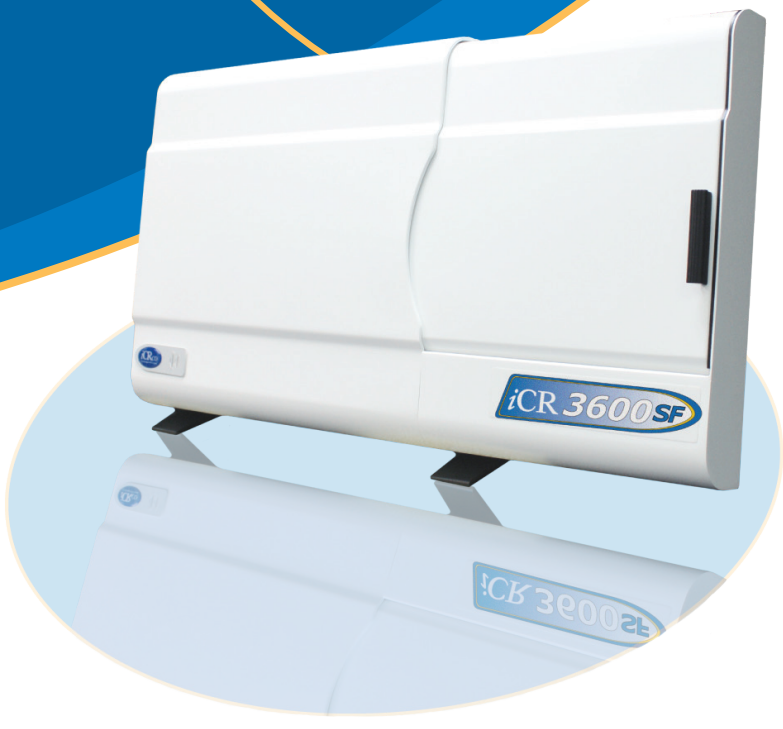
iCR3600SF

USER MANUAL





iCRco

Digital Imaging Made Simple.™

Foreword

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Terms

Any one of the following *i*CR products will be referred to as the "CR unit" throughout this document: *i*CR 1000®, *i*CR 1000 Dual®, *i*CR 2600®, *i*CR 2600 Dual®, *i*CR 2600SF®, *i*CR 3600®, *i*CR Vet®, *i*CR Vet Dual®, *i*CR Mobile®, *i*CR 1-D®, *i*CR Chiro®, *i*CR Chiro Dual® *i*CR VERTX® Any one of the following *i*CR products will be referred to as "*i*CR dual unit" throughout this document: *i*CR 1000 Dual®, *i*CR 2600 Dual®, *i*CR Vet Dual®, *i*CR Chiro Dual® Any one of the following *i*CR products will be referred to as "*i*CR desktop unit" throughout this document: *i*CR VERTX®. The *i*DR®will be referred to as the "DR unit" throughout this document.

Contact Information

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*i*CR 3600 SF Information

Please Enter the details of the *i*CR 3600 SF system here:

Serial Number: _____

Date Purchased: _____

Interface Type: USB 2.0

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Safety Information

Read and understand the installation and operating instructions before applying power to the *i*CR 3600 SF.

Conventions

⚠ DANGER A DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

⚠ WARNING A WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION A CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

Note A NOTE indicates important information that helps you make better use of your *i*CR 3600 SF and Software.

Notice A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

Laser Safety

⚠ CAUTION This equipment employs a laser. Laser radiation may be present if the *i*CR 3600 SF is operated without the covers. Avoid the laser beam. Direct exposure to laser light must be avoided.

The *i*CR 3600 SF incorporates a Red $\geq$ 80mw high-power solid-state laser diode. The *i*CR

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3600 SF covers protect the service person from direct exposure to laser light. These covers will protect a user/service person only if they are properly installed. Covers must be removed and replaced by properly trained service personnel. Contact *i*CRco if there are any issues with the covers being damaged or replacement covers are needed.

Electrical Hazards

⚠ WARNING This equipment is operated with hazardous voltages which can shock, burn, or cause death.

Notice The *i*CR 3600 SF must be connected to a uninterruptible power supply (UPS). Failure to use a (UPS) will void the warranty.

The equipment must be serviced by properly trained technicians certified by *i*CRco, Inc. Do not connect the *i*CR 3600 SF with a damaged or sub-standard power cable. Do not use an extension cord with this device. The *i*CR 3600 SF should be properly grounded and power connections inspected to ensure safe operation. Use at least a 1300VA (780W) uninterruptible power supply (UPS) with this device, as it is sensitive to variations in power.

Malfunctioning Equipment

If any *i*CRco product shows signs of malfunction, discontinue the use of the product immediately and contact Technical Support at 310-921-9559.

FCC Notification

This equipment generates, uses, and can radiate radio frequency energy, and if not installed properly, can cause interference with radio communications.

Mammography Use

The *i*CR 3600 SF is not intended for Mammography use.

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Guidance and Manufacture's declaration – Electromagnetic Emissions & Immunity

Table 1: Electromagnetic Emissions

Guidance and manufactures' declaration – electromagnetic emissions		
The ***i***CR 3600 SF is intended for use in the electromagnetic environment specified below. The customer or the user of the ***i***CR 3600 SF should assure that it is used in such an environment.		
Emissions test	**Compliance**	**Electromagnetic environment – guidance**
RF emissions CISPR 11	Group 1	The ***i***CR 3600 SF uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The ***i***CR 3600 SF is suitable for use in all establishments, including domestic and those directly to the public low voltage pwoer supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class B	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

Table 2: Electromagnetic Immunity

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±(2, 4, 6) kV Contact ±(2, 4, 8) kV air	±(2, 4, 6) kV Contact ±(2, 4, 8) kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1kV for input/output lines	±2 kV for power supply lines ±1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.

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Table 2 continued...

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Surge IEC 61000-4-5	±1 kV differential mode ±2 kV common mode	±1 kV differential mode ±2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. <5% U_T (>95% dip in U_T) for 5 sec.	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. <5% U_T (>95% dip in U_T) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of the ***i***CR 3600 SF requires continued operation during power mains interruptions, it is recommended that the ***i***CR 3600 SF be powered from an uninterruptible pwoer supply or a battery.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

continued on next page...

Table 2 continued...

Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic Environment – Guidance**
Conducted RF IEC 61000-4-6 Radiated RF IEC 61000-4-3	3Vrms 150 kHz to 80 MHz 3 V/m 80 MHz to 2.5 GHz	3Vrms 3 V/m	Portable and mobile RF communications equipment should be used no closer to any part of the ***i***CR 3600 SF, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separations distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz to 800 MHz $d = 2.3\sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b]. Interference may occur in the vicinity of equipment marked with the following symbol:

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflections from structures, objects and people.

continued on next page...

Table 2 continued...

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment – Guidance

[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location where the *i*CR 3600 SF is used exceeds the applicable RF compliance levels above, the *i*CR 3600 SF should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the *i*CR 3600 SF.

[b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

*i*CRco Warranty

*i*CRco, Inc. ("*i*CRco") values your business and always strives to provide high quality products and services. All *i*CRco products are provided with an initial warranty so the hardware and software are covered from the date of purchase. This limited warranty solely applies to new products manufactured by or for *i*CRco and originally purchased from *i*CRco or an authorized dealer of *i*CRco products for your own use. In addition, an extended warranty is available for most new and recently purchased *i*CRco products for an additional charge.

Hardware Limited Warranty

*i*CRco warrants its hardware products to be free of defects in materials and workmanship for a period of one (1) year from the date of original shipment from *i*CRco subject to the limitations set forth herein. If a product proves to be defective in material or workmanship during the warranty period, *i*CRco will, at its sole option, repair or replace the product with a similar product. Repaired and replacement products may be or include refurbished or remanufactured parts. Any replacement item assumes the remaining warranty period of the original product. *i*CRco provides no warranty for any third party hardware or software included with any product or later acquired.

Software Limited Warranty/Support

*i*CRco warrants that its QPC XSCAN32, Captera, and/or ClarityPACS software originally provided with any product will substantially conform to *i*CRco's specifications and that

the media, not including hard drives, on which the software is furnished will be free from defects in materials and workmanship under normal use for a period of one (1) year from the date of original shipment from *i*CRco. *i*CRco's sole obligation under this warranty is limited to making reasonable efforts to ensure such conformity and to supply the consumer with a corrected version of the software as soon as it is practical after the consumer has notified *i*CRco of any non conformity. *i*CRco does not warrant that the operation of any software will be uninterrupted, glitch or error free or that functions contained in the software will operate in the combinations which may be selected for use by the user or meet the user's requirements. This limited software warranty will be void if the software is modified without the written approval of *i*CRco or is used outside of the recommended parameters or equipment. *i*CRco does not provide any warranty or support for any other software.

*i*CRco agrees to provide one (1) year of telephonic and/or e-mail based support for QPC XSCAN32, Captera, and/or ClarityPACS software originally provided with any new *i*CRco product from the date of original shipment from *i*CRco. All software support shall be limited to making reasonable efforts to resolve *i*CRco software issues and shall be limited to *i*CRco's regular business hours. In addition, *i*CRco will provide revisions and upgrades to its software upon request (when available) during the first year after the software was originally shipped from the *i*CRco factory. The initial support period will include support via remote login software (GoToMeeting), only if the customer has access to the Internet from that PC and only if the customer agrees *i*CRco shall have no liability in connection with its support efforts. Remote login software allows *i*CRco technical support to remotely access the customer's PC via the Internet for the purposes of rendering technical support. Please note that this warranty, including software support, does not include computer hardware, third party software or operating system or network issues, which are outside the control of *i*CRco.

Warranty Product Technical Requirements

*i*CRco requires that all DR, CR, Scanner and/or products requiring PCs be fitted and installed with a 1500VA (1500W) uninterruptible power supply ("UPS"). *i*CRco recommends the APC 1000 specification UPS or equivalent. For warranty evaluation and service, *i*CRco requires the customer to provide an Internet connection (DSL or Dial-up) or the minimum of a phone line accessible by an extension cord to the product enabling *i*CRco technicians to perform remote diagnostics on installed equipment. In addition, each *i*CRco product must be installed, maintained and operated in accordance with the respective product manual. Failure to comply with these requirements will result in a voided warranty claim.

Requesting Warranty Service

For information on obtaining warranty service, call *i*CRco's customer support at (310)921-9559. In order to evaluate a warranty service request, *i*CRco requires the following information: the *i*CRco serial number of the product, a detailed description of the problem,

customer name and contact information; product location and operating conditions; a copy of the purchase documents, and sufficient information and authorization, including a liability release as to any loss of data (that should always be backed up), software or network injury, or downtime, allowing ***i***CRco technicians remote access to the product. Product may not be returned to ***i***CRco without first obtaining a Return Material Authorization ("RMA") number from ***i***CRco. Prior to providing an RMA, ***i***CRco may require remote access to the product. If ***i***CRco determines that the product may be defective, is under warranty and necessitates a return to ***i***CRco for service, an RMA number and instructions for return of the product will be given. ***i***CRco is not responsible for any unauthorized returned product, i.e. one for which an RMA number has not been issued by ***i***CRco.

Warranty service requires all authorized returns be shipped to the ***i***CRco factory prepaid and insured. All such authorized returns are the customer's responsibility. For products sold and located within the United States, ***i***CRco will pay for return shipping.

Products being returned are only to be shipped in ***i***CRco approved shipping containers. The original box and packaging materials are approved and should be kept for moving and/or shipping the product. Approved packaging my also be purchased from ***i***CRco for an additional charge. ***i***CRco shall have no liability nor responsibility for warranty service to any product that is not shipped in an ***i***CRco approved shipping container or that is damaged from incorrect packaging or damaged during shipping.

Additional Warranty Limitations and Extent of Warranty

This warranty does not apply if the product has been damaged by accident, misuse or abuse. In addition, warranty service does not include the repair of failures or defects caused by: unauthorized attachments to any ***i***CRco product, unsuitable physical or operating environment, maintenance or repair by anyone other than ***i***CRco or the ***i***CRco authorized dealer that sold the product, operation of a product beyond its duty cycle, use of the product outside of its specifications, the use of supplies, parts, materials, software, or interfaces not furnished, authorized or recommended by ***i***CRco. If the product, including any software has been opened, tampered with, modified or altered in any way without written authorization by ***i***CRco, the warranty will no longer apply.

This warranty applies only to products manufactured by, or for, ***i***CRco, and that can be identified by an "***i***CRco" serial number as originally affixed to the product. Any modification to the ***i***CRco serial number tag or its attachment to the product shall immediately void the warranty.

This warranty is non-transferable and subsequent owners must contact ***i***CRco to establish if the equipment is eligible for an extended warranty.

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Limitation of Remedies and Liability/Exclusion of Damages

The exclusive remedy for any defective product is limited to the repair or replacement of the defective product. ***i***CRco shall have a reasonable time after determining that a defective product exists to repair or replace a defective product. ***i***CRco's entire liability for any product is limited to the actual purchase price for the product. This limitation applies even if ***i***CRco cannot or does not repair or replace any defective product.

IN NO EVENT WILL ***i***CRco BE LIABLE FOR ANY GENERAL, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES, including but not limited to, damages related to the loss of use, loss of recorded product, the installation of replacement product, or any inspection, testing, or redesign caused by any defect or by the repair or replacement of any product arising from a defect in any product. This exclusion of damages applies even if the customer advises ***i***CRco or an ***i***CRco dealer of the possiblity of such damages. *This limitation of remedies also applies to claims against any suppliers or dealers of* ***i****CRco.* ***i****CRco and its suppliers' and dealers' limitations of remedies are not cumulative. Such suppliers and dealers are intended beneficiaries of this limitation.* ***i****CRco is not liable for any claim by or against the customer arising from a third party claim.*

Revision History

Revision	Author	Date	Notes
A	MS	2008-07-06	Initial Release
B	MS	2010-01-27	Revised for new computer bracket
C	MS	2010-03-22	Updated safety information

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1. Introduction

1.1 Overview

The CR unit is an ultra high resolution Computed Radiography device. It is designed to scan cassettes containing phosphor screens (CR plates) using patented technology. CR plates are transported past a scanning head without bending or using rollers. This flat scan path results in ultra high resolution images with high fidelity across the entire image. High resolution is achieved from the CR plates by coupling the flat scan path with a high energy laser.

The CR unit collects 16 Bit data that is converted to a DICOM 3.0 image and can be stored, viewed, manipulated, and sent to any other storage device, printer, or viewing station through DICOM. This document contains a basic technical overview of the CR unit including the optical systems, electronic components, and driving software subsystems. A general description of the systems functionality and user interfaces will be described. Unpacking of the hardware is covered, as is software installation, and troubleshooting are also included. This document is intended for users or service people who need to understand the basic underlying principles of operation for the CR unit.

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2. Pre-Installation

2.1 Voltage Requirements

The *i*CR 3600 SFincorporates an international switching power supply. *i*CRco employs CE certified medical grade universal power supplies to allow the unit to work between 90 to 253V AC 50/60Hz. In order to run the *i*CR 3600 SFwith different power types, apply voltage to the power input module at the end of the *i*CR 3600 SF. For international units, a local power cord must be used that can handle the power requirements of the unit. A 13A/125V power cord is sufficient.

2.2 Environmental

The *i*CR 3600 SF should not be placed in a room with a film processor present. This will void the warranty. The humidity and temperature limits are 20 to 80% non-condensing, and 50 to 95°F (10 to 35°C) operating, respectively.

Installation of the *i*CR 3600 SF near high magnetic fields may cause the *i*CR 3600 SF to malfunction. The *i*CR 3600 SF should not be placed in a room with an MRI, CT, or any other equipment that produces high magnetic fields.

The room should have good ventilation. Another factor to consider prior to installing the *i*CR 3600 SF is dust and particulates in the environment. The *i*CR 3600 SF is designed to be resistant to dust and particulates that may be present at the installation site.

2.3 Connectivity and Power Supply

The room needs to have wall power and **should not be used with an extension cord**. Use at least a 1300VA (780W) UPS between the wall power and the *i*CR 3600 SF. It is also required to have a network connection for fast technical support. Alternatively, the user must have a phone/fax line that can be connected to the PC in order to comply with *i*CRco warranty terms.

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2.4 Power Switch Location

The power switch for the CR unit is located on the left hand side of the unit, directly to the right the fan.

2.5 Power and Scan Lights

The power and scan lights are located on the lower left-hand side of the CR unit. When the unit is powered on, the green light is illuminated. While the unit is scanning the yellow light will blink.

2.6 Physical Requirements

The *i*CR 3600 SFrequires a stable operating environment. It is important the system is placed on a table, stand or wall mount that provides adequate support.

2.7 System Specifications

Power Requirements

Domestic	100 to 120V, 50/60Hz, 3.5A
International	220 to 240V, 50/60Hz, 1.75A

Humidity

15 to 95% non-condensing

Temperature Conditions

32 to 105°F (0 to 40°C)	- operating
0 to 150°F (-18 to 65°C)	- non-operating

Pixels per Line Resolution

3500 (High Resolution) over 356mm (14 inches) 2048 (Normal Resolution) over 356mm (14 inches).

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Scan Rate

Scan Rate 60 lines/second

Grey Scale Resolution

16 bits (65,535 shades of gray)

Interface

USB 2.0

Dimensions

iCR 3600 SF 10W x 18H x $34\frac{1}{2}$L inches

Vibration/Acceleration

3-4G Max (in shipping)

Altitude

0 to 9,500 ft. - operating

Weight

iCR 3600 SF 70 lbs

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3. Hardware Installation

3.1 Unpacking Instructions

1. Open the box from the top.
2. Remove any small accessories loaded into the top of the box.
3. With at least two (2) people, lift the *i*CR 3600 SF out of the box.
   ⚠ CAUTION Always practice proper heavy lifting procedures. Failure to practice proper lifting procedures may result in injury or damage to the unit.
4. Store the box and any foam inserts somewhere safe & dry, so that if the *i*CR 3600 SF needs to be shipped again, there are packing materials available.

3.2 Installing Power Cable

1. Plug the power cable for the *i*CR 3600 SFinto the power switch unit.
2. Plug the other end of the power switch cord into the UPS.
3. Make sure the UPS is not in bypass mode.
4. Plug the UPS into a standard wall outlet.

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3.2.1 International Power Cable

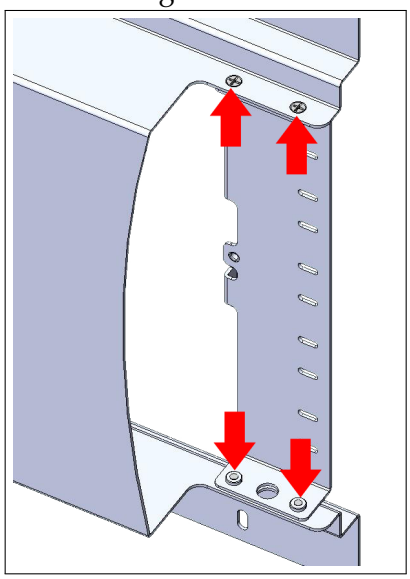
The ***i***CR 3600 SFutilizes an international IEC grade connector for the power cable. Systems are shipped with a standard NEMA 5-15 hospital grade cable. The cable needs to be changed depending on the male end, which varies from country to country.

3.3 USB 2.0 Cable Installation

1. Visually inspect the cable to ensure that it is not cut, frayed, or otherwise damaged.
2. Plug the USB B end of the cable end to the CR unit's USB 2.0 port.
3. Plug the USB A end of the cable end into a free USB 2.0 port on the computer

1. Attach the Back Computer Mounting bracket to the Computer Mounting Bracket using four (4) 6-32 x $\frac{1}{4}$" flathead screws (Figure 3.1).

Figure 3.1:



2. Remove four (4) 6-32 x $\frac{3}{8}$" truss head screws from the cassette tray (Figure 3.2).

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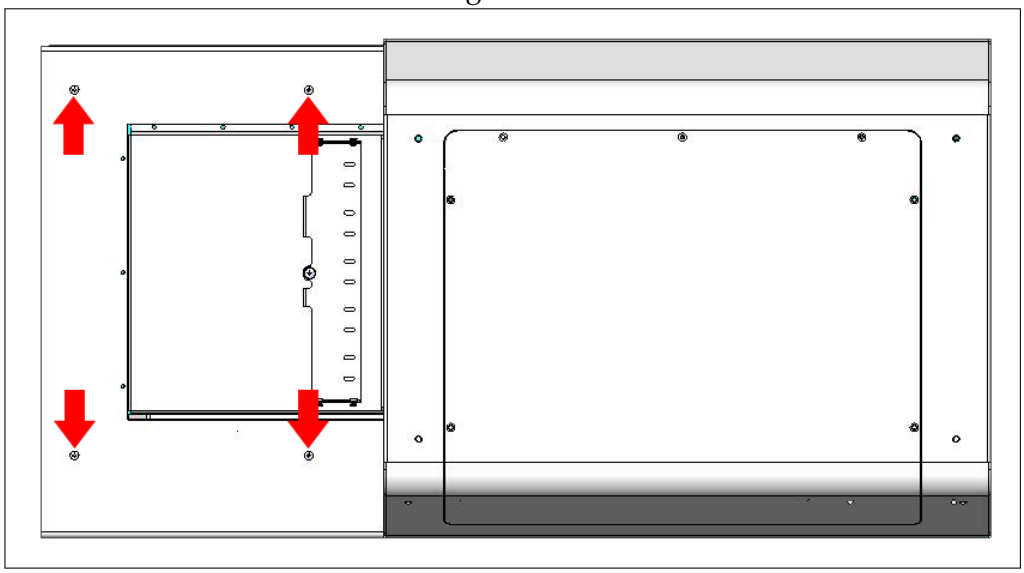
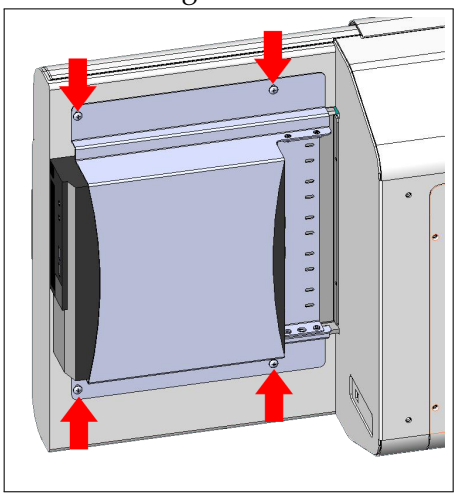
Figure 3.2:



3. Align the computer mounting bracket on the back of the cassette tray.
4. Once the screw holes are aligned, fasten the computer mounting bracket to the CR unit using four (4) 6-32 x $\frac{1}{2}$" truss head screws (Figure 3.3).

Figure 3.3:



5. Carefully slide the computer into the computer mounting bracket (Figure 3.4).
   Note For easy access to the CD-ROM drive, make sure the drive opens towards the outside of the unit.

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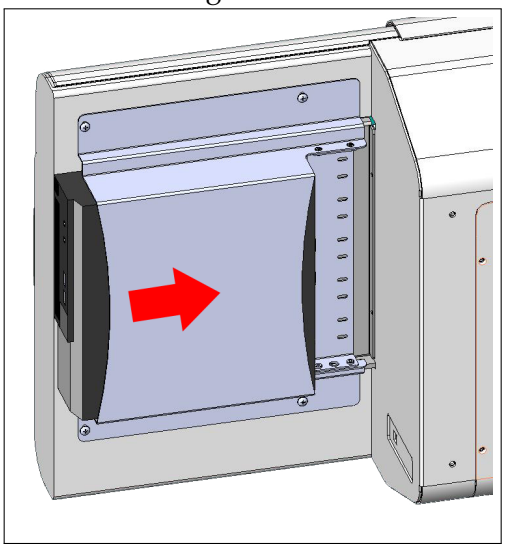
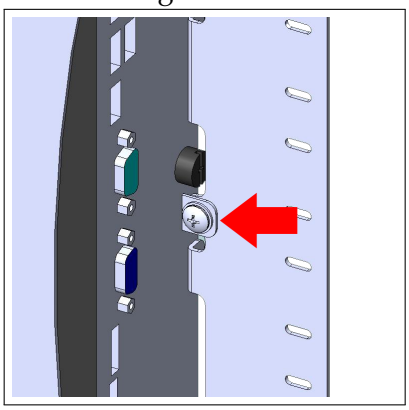
Figure 3.4:



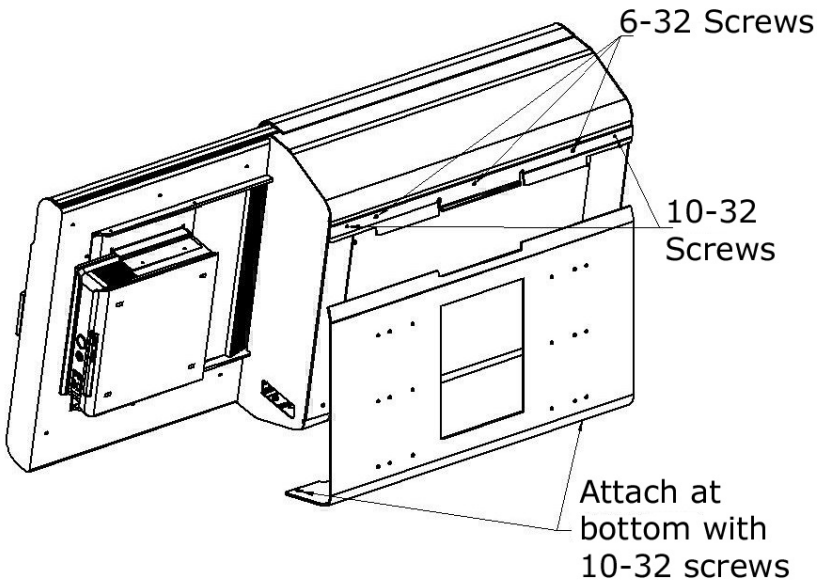
6. Fasten the computer to the mounting bracket using one (1) 8-32 x $\frac{3}{8}$″ truss head screws and #10 flat washer. The computer's security tab should be in between the washer and the mounting bracket (Figure 3.5).

Figure 3.5:



3.4 Wall Mounting Plates

Notice Wall mounting plates must be installed by a licensed contractor.



1. Attach the large wall mounting plate against wall at desired height. Allow the contractor to determine the proper screws to fasten the large wall mounting plate to the wall.
2. Attach the small wall mounting plate to the CR unit with three (3) 6-32 x $\frac{3}{8}$″ flathead undercut screws and two (2) 10-32 x $\frac{3}{4}$″ truss head screws.

   ⚠ CAUTION Always practice proper heavy lifting procedures. Improper lifting may cause injury.
3. With at least two people, lift the CR unit onto the large wall mounting plate so that the bottom of the small wall mounting plate rests in the top notch of the large wall mounting plate.
4. Secure the bottom of the CR unit to the bottom of the large wall mounting plate with two (2) 10-32 x $\frac{3}{4}$″ truss head screws.

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4. Software Installation

4.1 USB Driver Installation

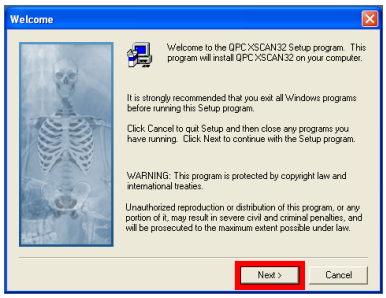
Installation of USB drivers are automatic with the installation of the *i*CRco software (i.e., QPC XSCAN32).

4.2 Installing QPC XSCAN32

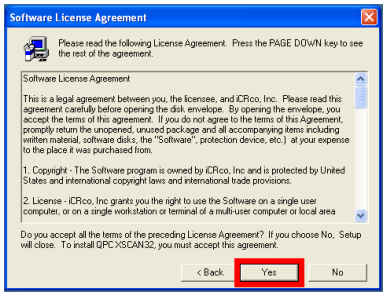
QPC XSCAN32 software comes bundled with the CR unit. This software package will allow the user to interface with the CR unit.

Note If you have QPC XSCAN32 already installed on your computer and it is running while you are trying to install the new version, an error will appear in the install process. Please close QPC XSCAN32 and reinstall the new version.

1. Insert the media containing the QPC XSCAN32 installer into the computer. Navigate to the *QPC XSCAN32* folder.
2. Launch the QPC XSCAN32 installer by double clicking **Setup.exe**.
3. Click **Next** at the welcome screen.


Welcome
Welcome to the QPC XSCAN32 Setup program. This program will install QPC XSCAN32 on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
Next >
Cancel

4. Click **Yes** to agree to the Software License Agreement.


Software License Agreement
Please read the following License Agreement. Press the PAGE DOWN key to see the rest of the agreement.
Software License Agreement
This is a legal agreement between you, the licensee, and iCRco, Inc. Please read this agreement carefully before opening the disk envelope. By opening the envelope, you accept the terms of this agreement. If you do not agree to the terms of this Agreement, promptly return the unopened, unused package and all accompanying items including written material, software disks, the "Software", protection device, etc.) at your expense to the place it was purchased from.
1. Copyright - The Software program is owned by iCRco, Inc and is protected by United States and international copyright laws and international trade provisions.
2. License - iCRco, Inc grants you the right to use the Software on a single user computer, or on a single workstation or terminal of a multi-user computer or local area
Do you accept all the terms of the preceding License Agreement? If you choose No, Setup will close. To install QPC XSCAN32, you must accept this agreement.
< Back
Yes
No

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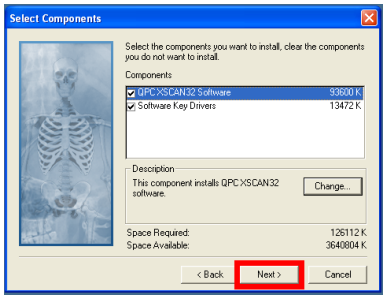
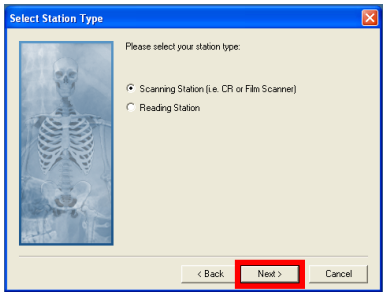
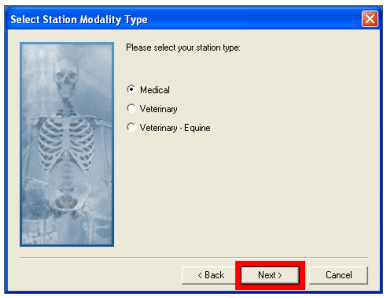
5. Make sure both *QPC XSCAN32 Software* and *Software Key Driver* boxes are checked, then click **Next**.


Select Components
Select the components you want to install, clear the components you do not want to install.
Components
QPC XSCAN32 Software 93600 K
Software Key Drivers 13472 K
Description
This component installs QPC XSCAN32 software.
Change...
Space Required: 126112 K
Space Available: 3640804 K
< Back
Next >
Cancel

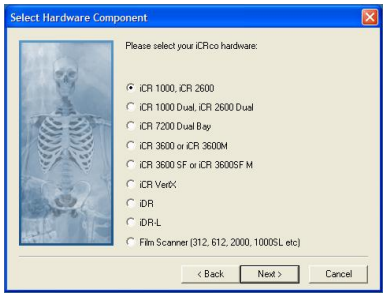
6. Select *Scanning Station* or *Reading Station* depend on the use, then click **Next** to continue.



7. Select the appropriate modality, then click **Next** to continue.



8. Select the appropriate CR hardware profile, then click **Next** to continue.



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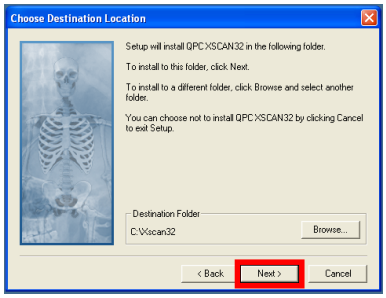
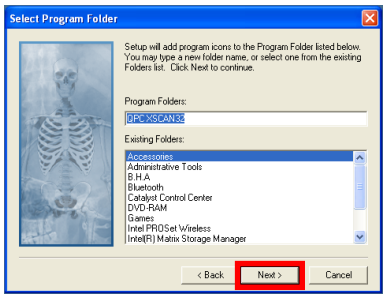
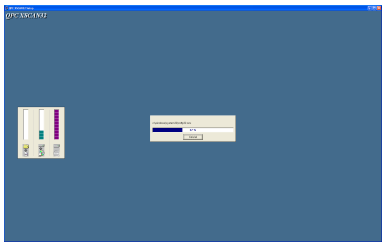
9. The Destination Folder should be set to *C:\Xscan32* then click **Next** to continue.


Choose Destination Location
Setup will install QPC XSCAN32 in the following folder.
To install to this folder, click Next.
To install to a different folder, click Browse and select another folder.
You can choose not to install QPC XSCAN32 by clicking Cancel to exit Setup.
Destination Folder
C:\Xscan32
Browse...
< Back
Next >
Cancel

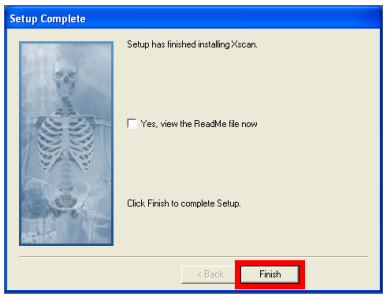
10. The Program Folder name should be set to *QPC XSCAN32*, then click **Next**.



11. QPC XSCAN32 will begin to install. Be patient while XSCAN32 installs.



12. Click **Finish** to complete the installation of QPC XSCAN32. The installer will exit.



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5. System Operation

5.1 Power-Up

1. Make sure the power cord is properly installed in the power module.
2. Make sure the power cord is properly installed in the UPS and the UPS is plugged into a standard wall outlet.
3. Make sure the USB 2.0 cord is properly installed in the ***i***CR 3600 SF and computer.
4. Power on the computer.
5. Power on the ***i***CR 3600 SF by pressing the power switch.

5.2 Cassette Handling

5.2.1 Overview

Unlike other solutions, the ***i***CR 3600 SF does not allow for contact to the delicate phosphor imaging plate. The hard X-ray cassette is designed to protect the plate and allow for it to be read by the ***i***CR 3600 SF. The delicate imaging plate is embedded within a rigid cassette in such a way that nothing touches the plate during the scanning or handling process.

5.2.2 Weight/Force Applied to Cassette

Apply only minimal weight and/or force to the cassette (for example, do **not** have a patient stand on the cassette for weight-bearing views). Use a weight-bearing cap when necessary.

⚠ WARNING Excessive weight/force may damage the cassette and may cause the CR unit to malfunction. Do not apply excessive weight/force to the cassette.

5.2.3 Cassette Storage

All cassettes should be stored in the cleanest, driest conditions possible. Always store cassettes in a location where they are not likely to be knocked over or damaged. With careful handling the cassette plate system should provide years of service as there is no known lifetime for the phosphors used in the plate system.

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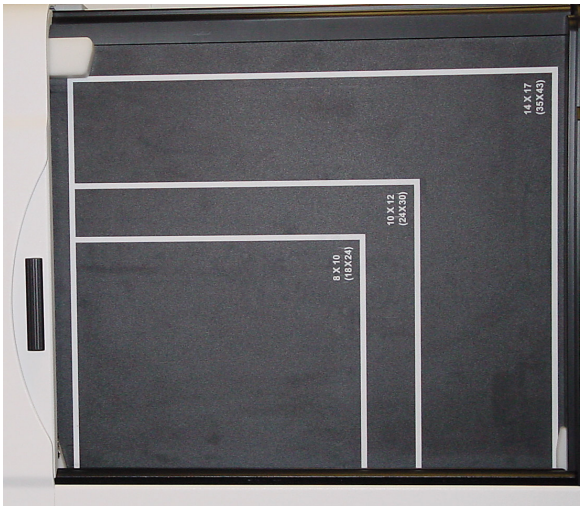
5.2.4 Cassette Contamination

Should the situation arise where a cassette may come in contact with bodily fluids or other contaminated materials, place the cassette in a clean plastic bag before exposing the X-ray. This will ensure that the cassette stays clean and usable.

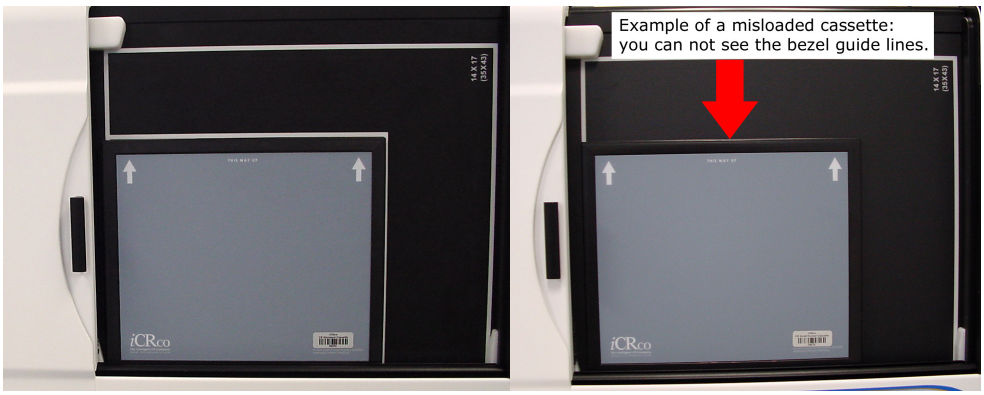
5.3 Cassette Loading

1. Before loading the cassette, orient it properly, with the blue side of the cassette facing towards the operator with the arrows pointing upwards.
2. Locate the proper sized guide lines on the bezel of the CR unit.



3. At an angle, load the cassette bottom first into the scan bar.
   ⚠ CAUTION Do not use excessive force when loading the cassette! The cassette will not fit if the orientation is incorrect.

4. Gently push the top of the cassette into place.
5. If loaded correctly, the user will see the white guide lines around the edge of the cassette.



6. Close the bay door.

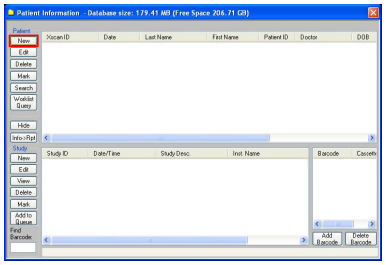
5.4 Acquiring an Image

⚠ WARNING This equipment employs a laser. Laser radiation may be present if the CR unit is operated without the covers in place. Avoid the laser beam. Direct eye exposure to laser light must be avoided.

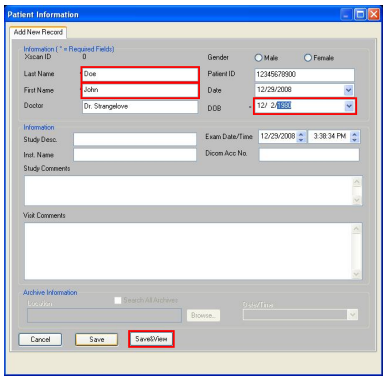
Note The instructions in this section represent a typical CR workflow. Every workflow varies in process.

1. Open the door on the CR unit.
2. Load the cassette into the CR unit. The blue, non-carbon fiber side of the cassette faces away from the CR unit.

   ⚠ CAUTION Do not use excessive force when loading the cassette! The cassette will not fit if the orientation is incorrect. If the user requires more instruction on cassette loading, please see Section 5.3.
3. Open QPC XSCAN32.
4. Create or edit patient profile. To do this, click **New** or **Edit**, respectively.



5. If creating a new patient, enter the relevant patient info, or if editing a patient, change the information accordingly, then click **Save and View.**



6. Click on **Scan** to bring up the Quality Processing Center Scan dialog. (if it is a patient with no images the scan dialog will automatically appear).

7. The *i*CR Quality Processing Center dialog will appear.

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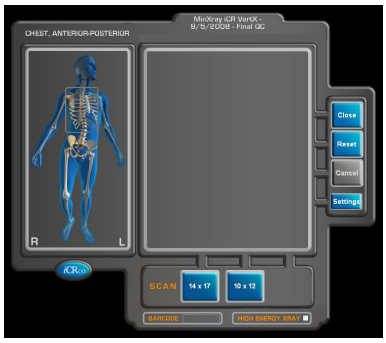
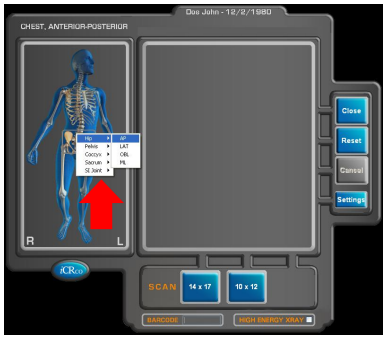
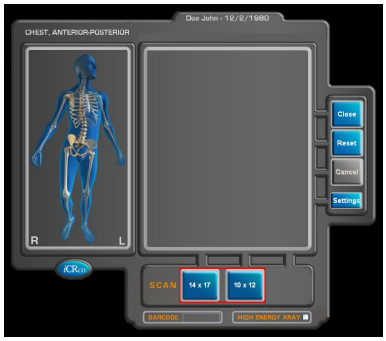


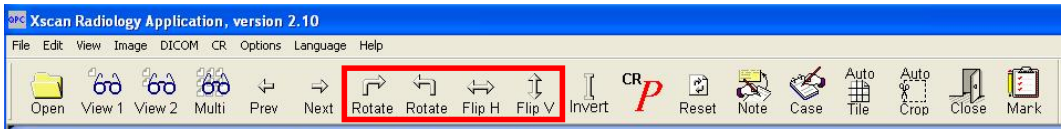
8. Select the anatomy by mousing over the skeleton on the left hand side of the Quality Processing Center dialog.



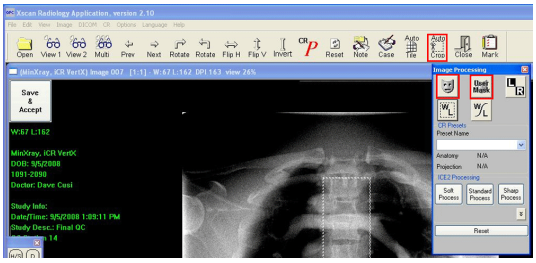
9. Select the cassette size by clicking the correct button (i.e. 14x17 in, 10x12 in). **This will start the scan.**



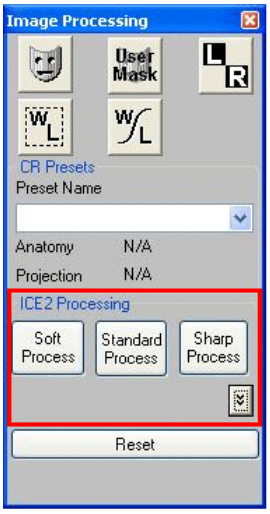
10. The preview window will display the image as it is scanning. Once it has finished scanning it will automatically import the image into QPC XSCAN32.
11. Open the scanned image by double clicking on the thumbnail.
12. Rotate/Flip to correct orientation using the Rotate and Flip buttons in the main tool bar.



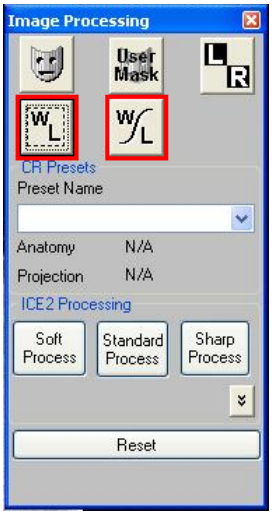
13. Remove any collimation by using the Auto Crop(located in the main toolbar), Mask, or User Mask (located in the Image Processing dialog) functions.



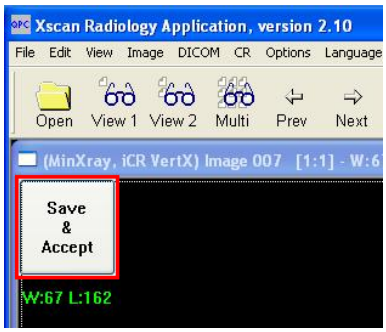
14. Process using ICE or ICE2 (located in the Image Processing dialog).



15. Window/Level the image using the Window/Level or Smart Box tools.



16. Accept and Save the image to save the processing and W/L settings by clicking the **Save and Accept** button in the upper left hand corner of the image.


Xscan Radiology Application, version 2.10
File Edit View Image DICOM CR Options Language
Open View 1 View 2 Multi Prev Next
(MinXray, iCR VertX) Image 007 [1:1] - W:6
Save & Accept
W:67 L:162

17. Return to the *Patient Information* window. Select the patient(s) to send to a PACS or viewing station. If you wish to send more than one patient, hold the Ctrl key down and left mouse click to select multiple patients.
18. After selecting the patient(s), click the **DICOM Send** button.

Xscan Radiology Application, version 2.10
File Edit View Image DICOM CR Options
Open DICOM Send DICOM Retrieve Merge Create CD
Send the selected images using DICOM

19. The *DICOM Targets* window will appear, choose the desired target, then click **OK**

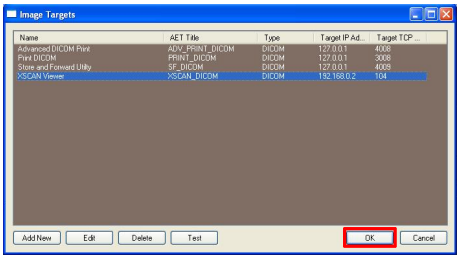
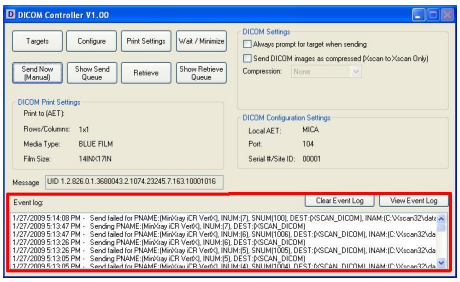


Image Targets
Name AET Title Type Target IP Ad... Target TCP...
Advanced DICOM Print ADV_PRINT_DICOM DICOM 127.0.0.1 4008
Print DICOM PRINT_DICOM DICOM 127.0.0.1 3008
Store and Forward Utility SF_DICOM DICOM 127.0.0.1 4009
XSCAN Viewer XSCAN_DICOM DICOM 192.168.0.2 104
Add New Edit Delete Test OK Cancel

20. The results of the DICOM Send will appear in the DICOM Controller window's Event log.


DICOM Controller V1.00
Targets Configure Print Settings Wait / Minimize
Send Now (Manual) Show Send Queue Retrieve Show Retrieve Queue
DICOM Settings
Always prompt for target when sending
Send DICOM images as compressed (Xscan to Xscan Only)
Compression: None
DICOM Print Settings
Print to (AET):
Rows/Columns: 1x1
Media Type: BLUE FILM
Film Size: 14IN X 17IN
DICOM Configuration Settings
Local AET: MICA
Port: 104
Serial #/Site ID: 00001
Message
Event log:
Clear Event Log View Event Log

5.5 Schedule of Maintenance

The following is a schedule of maintenance for the ***i***CR 3600 SF.

The following maintenance may be performed by end users:

Maintenance Procedure	**Frequency**
Clean cassettes	Weekly
Clean ***i***CR 3600 SF exterior covers	Monthly

The following ***i***CR 3600 SF maintenance must be performed by an ***i***CRco authorized service engineer only:

Maintenance Procedure	**Frequency**
Clean mirrors	Yearly
Vacuum inside case	Yearly
Clean fan filters	Monthly or when visibly dirty.

The following ***i***CR 3600 SF calibration maintenance must be performed by an ***i***CRco authorized service engineer only:

Maintenance Procedure	**Frequency**
Check image performance (Contrast/Noise Ratio and Spacial Resolution)	Quarterly
Perform Exposure Index calibration	Yearly

5.6 Periodic Cleaning

Periodic cleaning of ***i***CRco products should be done on a monthly basis.

5.6.1 Cleaning the Outside of the *i*CR 3600 SF

Note It is important that the covers remain on the ***i***CR 3600 SF at all times. The covers should only be removed for service by an ***i***CRco authorized technician, then immediately replaced.

⚠ CAUTION Do **not** clean the galvo mirror. Dust and fibers in the laser beam path may affect the radiographic image.

The outside covers of the ***i***CR 3600 SF should be cleaned with a slightly dampened cloth or a dry cloth moistened with Ball®SUNUP®glass cleaner or Sprayway©glass cleaner.

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5.6.2 Cassette Cleaning

⚠ CAUTION At no time should abrasive cleaners or chemicals be used to clean the cassette or plate.

Cleaning the Outside of the Cassette

1. Moisten a clean, lint-free cloth with a mild soap or detergent using soft water.
2. Wipe down the cassette covers thoroughly.
3. Allow the cassette to air dry.

Cleaning the IP Plate

1. With a finger, press the cassette catch located on the bottom rail on the cassette. This will release the carbon fiber door from the cassette.

2. Examine the imaging plate for dust or particulates.
3. Using ***i***CRco plate cleaner, apply the plate cleaner to a clean, lint-free cloth.

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Note If *i*CRco Plate Cleaner is not available, please contact Technical Support at 1-310-921-9559 to obtain more.

4. Gently wipe down the imaging plate with the clean, lint-free cloth.
5. Allow the plate to air dry before sliding the carbon fiber door back into place.

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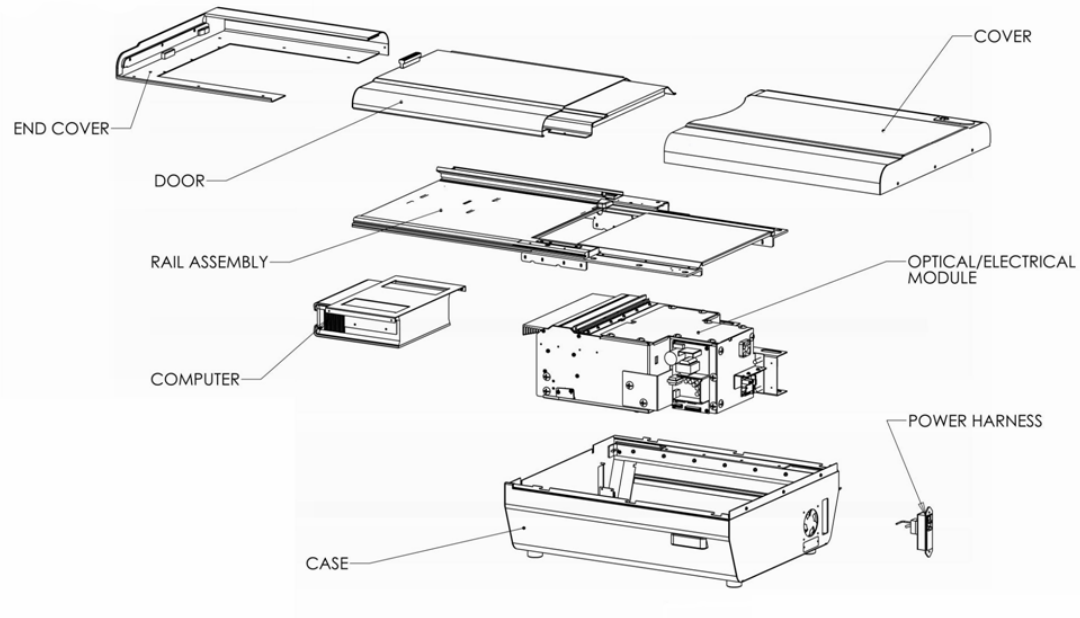
6. Theory of Operation

6.1 Product Overview

The *i*CR 3600 is a desktop/wall mount/portable CR that scans one cassette at a time. It is designed to accomplish this in about one minute to enable high throughput for a high volume X-ray room. It can be mounted on the wall directly beside or behind an X-ray control panel.

The 3600 produces a diagnostic quality image from a medical grade storage-phosphor image plate. The optical assembly provides a flying spot laser with a focal spot size of 50 microns. The laser scans across the plate and data is captured at a given rate. Each sample is reassembled to create an image. The capture sampling rate can be modified to create images with resolutions from 100 microns (250 DPI) to 200 microns (120 DPI). The unit can scan images up to 14 x 17". The laser spot focused to 50 microns is moved back and forth across an imaging plate as the plate is moved through the CR unit. The resulting Digital X-ray can be viewed, manipulated and stored and even printed to a film or paper image. The images are stored and manipulated using the standard medical image format (DCM) and the medical imaging transfer protocol, DICOM 3.0.

3600 System Overview



6.2 System Configuration

6.2.1 Optical Beam Path

The *i*CR 3600 SF contains a 664 nm 80 mW laser, laser power supply, Lens optic and two mirrors, a scanning galvanometer, and a light collection system.

The round laser spot is focused through a collimation lens to produce a round output beam. The beam is deflected by a galvanometer scanner to produce the scan across the plate. The folding mirrors bend the beam and the focused laser spot travels vertically down the plate as it moves horizontally across the scan head.

In order to reach the plate, the beam passes through an integrating collection cylinder. As it hits the surface of the plate, the red light from the focused laser stimulates blue emission from the image plate in direct proportion to the X-ray energy stored in the image plate as a result of the exposure. This blue light is collected by the integrating cylinder. The red light is blocked from reaching the photomultiplier tubes by blue glass filters.

The collected blue light is detected by photomultiplier tubes, which convert the photons into a signal.

This signal is then logarithmically amplified, corrected for spatial variations in the system sensitivity across the width of the screen, and then digitized by an A/D converter.

6.2.2 Galvonometer Board

The Galvo Servo board contains a feedback amplifier that results in extremely accurate control of the mirror mounted on the shaft of the scanning galvanometer.

The galvo motor shaft oscillates back and forth through an arc of approximately 30 degrees at a rate of 90Hz. A small mirror attached to the shaft intercepts the static laser beam and sweeps (scans) it across the width of the image plate.

6.2.3 Indicator Board

Two LED indicator lamps are used to signal scanner power ON and SCAN status. The SCAN indicator is turned on only while a scan is in process; it also blinks whenever the plate is in the optical path.

6.2.4 Anti-Jitter Board

A small L shaped board located at the end of the integration cylinder.

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6.2.5 PMT Board

The photomultiplier tube amplifies the photons from the CR plate and converts them into electrical signals.

6.2.6 Power Distribution Board

⚠ WARNING Do not handle supply when unit is on. Do not disconnect cables when unit is powered up.

Large supply:	± 18 V, ± 12 V, +5 V.
Small supply:	+24 V.
High Voltage Supply (PMTs):	1000 V.

6.2.7 LED Eraser Board

The LED Eraser board provides single wavelength light to erase CR plate.

6.2.8 Motor Controller Board

This section of the CR controls the stepping motor to drive the plate past the scan head and return it to the "home" position.

6.2.9 Analog to Digital Conversion

During the scanning process signals are generated by the PMT sensors and transmitted to the computer through a USBII interface cable. A trigger signal generated by the laser spot is transmitted to the PMT board to trigger a line capture. Image is assembled from lines of captured data that is held in registers and translated into a 16 bit raw source file. There is no way to pause the data capture process. Cancel will cause the machine to stop and return to home position. Data on the CR plate will be lost.

Note If an image is canceled during the scan process, the plate will have to be erased again to ensure that the plate is entirely erased.

6.2.10 Calibration

Gain Adjustment

Gain Control is used to compensate for reduction in sensitivity of the PMT detectors due to age. The gain can be adjusted in the software.

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6.2.11 PMT Amplifier

The amplifier is the interface between the PMT receiving the stimulated light from the collection chamber. The amplifier serves as a current to voltage converter and a log amplifier.

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7. Diagnostics

7.1 Overview

If a system failure occurs, it is necessary to diagnose the cause before beginning the repair. This section describes the diagnostic tools and techniques used to isolate various types of system failures. This chapter covers the most common failures and their fixes. If the user is unsure how to proceed with troubleshooting, please contact Technical Support.

The cause of some failures may be obvious. In these cases, the Service Engineer may proceed directly to the repair. Before beginning an investigation, it is a good practice to record as much information about the current state of the system as possible. This information may include, but is not limited to, symptoms, conditions under which symptoms exist, voltages, settings, cleanliness, and visual state. Normal generic troubleshooting techniques apply. With knowledge of the system, isolate the failure to a particular subsystem. With knowledge of the subsystem, trace the symptom back to its cause. In many cases, failures are caused by lack of periodic maintenance and cleaning. If a system is known to be behind schedule for its maintenance and cleaning at the time of the failure, it is a good practice to clean and re-calibrate the system before extensive troubleshooting. In many cases this solves the problem or provides clues as to the cause.

⚠ WARNING This equipment is operated with hazardous voltages which can shock, burn, or cause death.

⚠ CAUTION This equipment uses a laser. Direct exposure to the laser beam must be avoided.

⚠ CAUTION Do **not** operate the unit with the covers removed. Operating the ***i***CR 3600 SF with the covers removed may result in damage to ***i***CR 3600 SFand/or cause harm to the operator.

Preliminary Checks

1. Make sure the ***i***CR 3600 SF is powered by at least a 1300VA (780W) UPS (uninterruptable power supply).
2. Make sure that the ***i***CR 3600 SF is connected to the acquisition computer using a USB 2.0 cable (USB 1.0 or 1.1 cabling is **not** sufficient).
3. Check that the ***i***CR 3600 SF is powered by the provided power cable or source as covered in Section 2.1.
4. Make sure that other devices that emit strong radio frequencies are not in close proximity to the ***i***CR 3600 SF.

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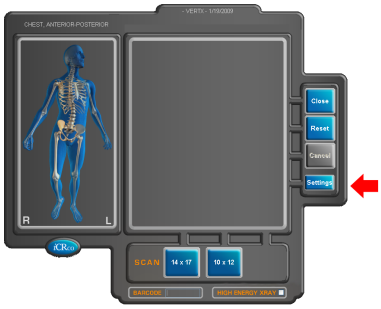
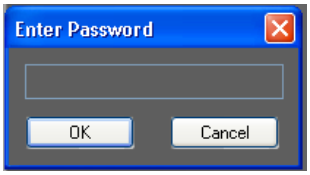
7.2 Using the Focus Tool for Hardware Diagnostics

The Focus tool is an efficient test that can provide the Service Engineer with valuable feed back regarding the functionality of the *i*CR 3600 SF's hardware. There are a series of questions following the work instructions that are designed to help include/eliminate potential failures in the *i*CR 3600 SF's subsystems.

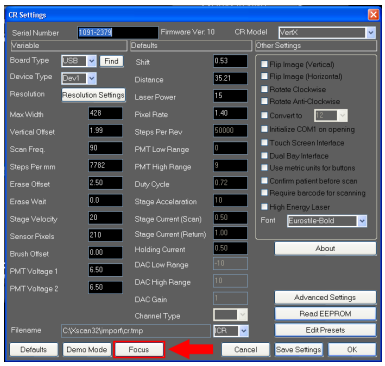
1. Leave the Cassette out of the unit and close the bay door.
2. Open QPC XSCAN32, access the Scan interface, then click the **Settings** button on the Scan interface.



3. Enter the password *earl* in the dialog box.



4. Click on the FOCUS tool Button along the bottom edge of the settings window.



5. A new window will come up, indicating the settings for the FOCUS tool. Use the standard settings in the focus tool. Click **OK** in the dialog box. This moves the carriage 4 inches into the unit, and begins to capture data.

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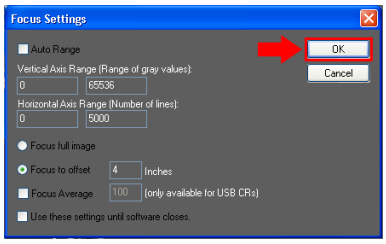
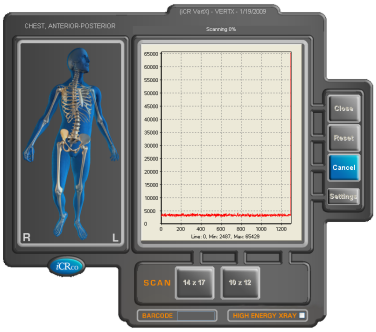


6. If the unit is working correctly, you will see a red data line, moving as the data is passed to the PC, one line at a time. In the default configuration, the scale is 65,000 levels of gray along the vertical axis of the window, and pixel location along the horizontal axis of the window. The Data line will be between zero and 2,500. If the line is not between zero and 2,500, you may need to re-adjust the zero point of the scanner.



7. Open the dust cover of the ***i***CR 3600 SF, the Data line should rise and lower slightly according to the position of the bay door. If the room is illuminated by high frequency fluorescent lights, the line may become sinusoidal (Wavy) and move away from the zero point.

What can we see by looking at the digital output of the *i*CR 3600 SF?

1. The unit must be capturing data because there is data being captured by the PC
2. The Laser is working because the laser moving past a start scan sensor tells the unit to start capturing data
3. The Start Scan sensor is working
4. The Galvanometer is working, swinging the laser back and forth
5. The Motor is working, moving the carriage 4 inches into the ***i***CR 3600 SF
6. The unit is sensing light variations as the line is rising due to more light leaking into the scan head.
7. The electronics are functional, and the cables are connected properly
8. The unit's amplifier is working, as is the ADC and the USB 2.0 interface on the unit

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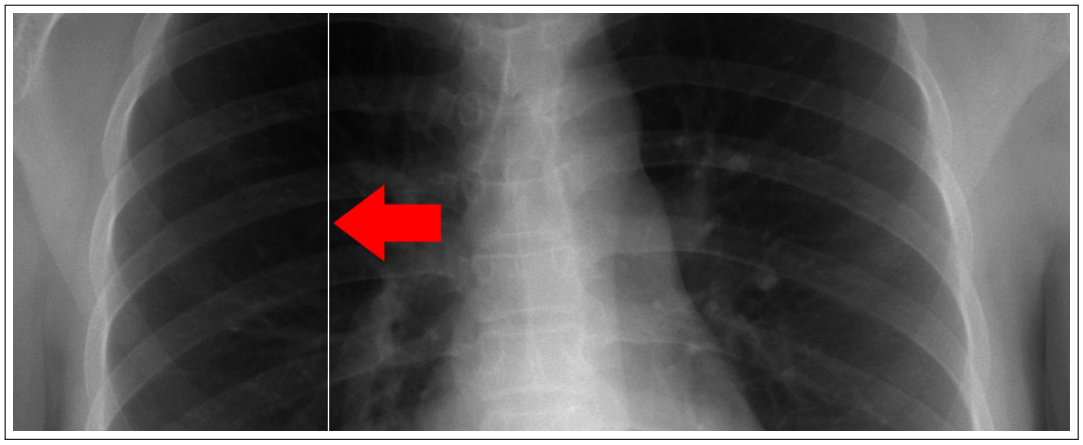
If the focus tool does not come up, what questions can we ask?

1. Is there power to the unit (Green Power light on and steady?, Orange scan light off, or on and blinking?)
2. Does the unit move before an error condition is seen? If so, motor is working and carriage is functioning. If not, several things can be wrong: No connection to PC, No power to Unit, bad USB cable.
3. Is there a NO DATA ACQUIRED error after the motor comes to rest at the scan position?

   This indicates that the unit is not transmitting data to the PC. Please see Section 7.5 for more information.

7.3 Image Symptoms

7.3.1 Lint in the Scan Path



Symptom: Sharp, white lines, usually only a pixel or two in width and spanning the length of the entire image.

Cause: Lint or other particulate matter in the scan slot.

Solution: See Section 8.3 for instructions on accessing the scan slot. Once the user has access to the scan slot, visually inspect the area in and around the scan slot for particulates and remove them by hand, or with a vacuum if necessary.

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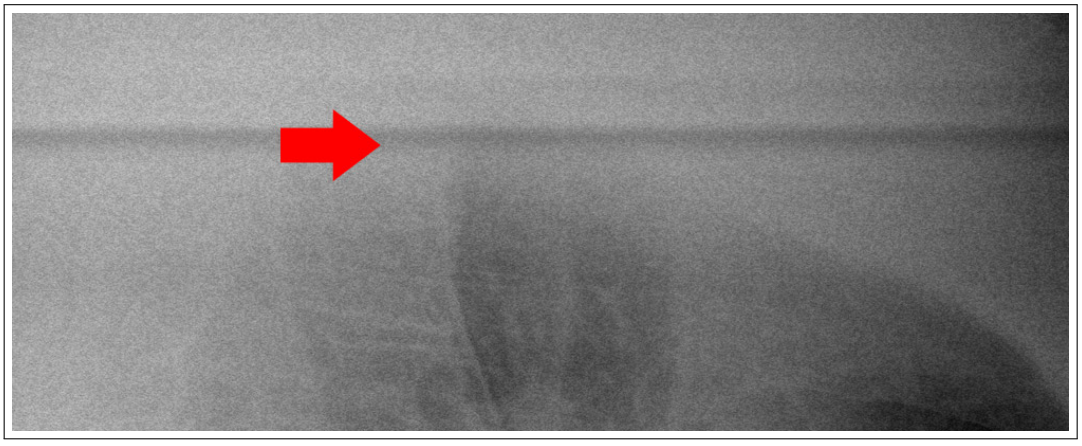
7.3.2 Dust Lines

Symptom: Light, blurred lines across the long axis of the cassette.

Cause: Dust or lint on the mirrors.

Solution: To clean the mirrors, please see Section 8.11 for instructions.

7.3.3 Horizontal Lines in Image



Symptom: Horizontal lines in Images.

Cause: Bump in motion path.

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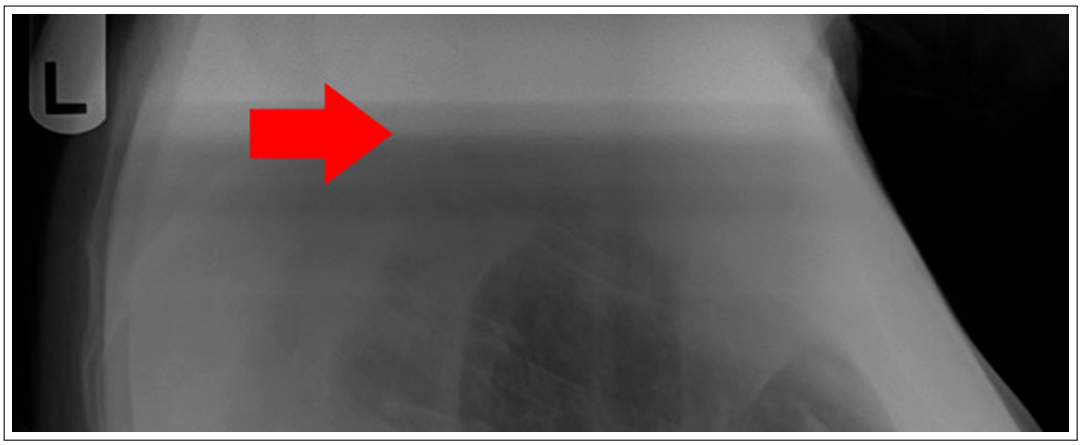
Solution:

1. Ensure that there is no blockage in the cassette scan path.
2. If there is no blockage of the scan path, the user may need to reposition the Caterpillar Brush. Please see Section 8.13 for instructions. If the Caterpillar Brush is worn out, please contact Technical Support to obtain a replacement brush.
3. If a solution has not been reached, please contact Technical Support.

7.3.4 Banding Top/Bottom 17" Length



Symptom: Horizontal line in image.

Cause: Unstable power supply / Excessive ambient light / Bad PMT board / PMT sensor / Bad Galvo

Solution:

1. Ensure that the CR unit is powered via a UPS. Ensure the UPS is not in bypass mode.
2. Ensure that the ambient room light is no more than 2EV. Turning off or dimming the room light should be adequate.
3. Unplug the network cable from the computer, then make a test scan to see if the banding is eliminated.

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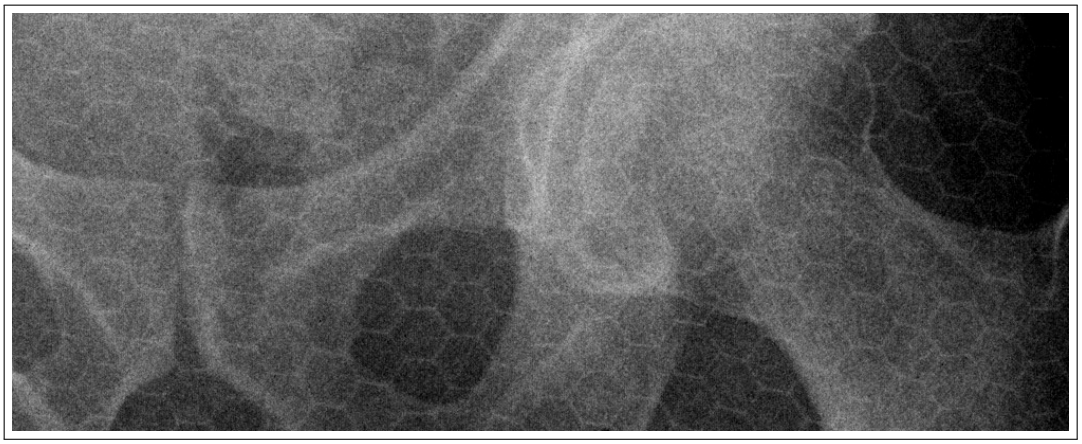
7.3.5 Up-side Down Cassette

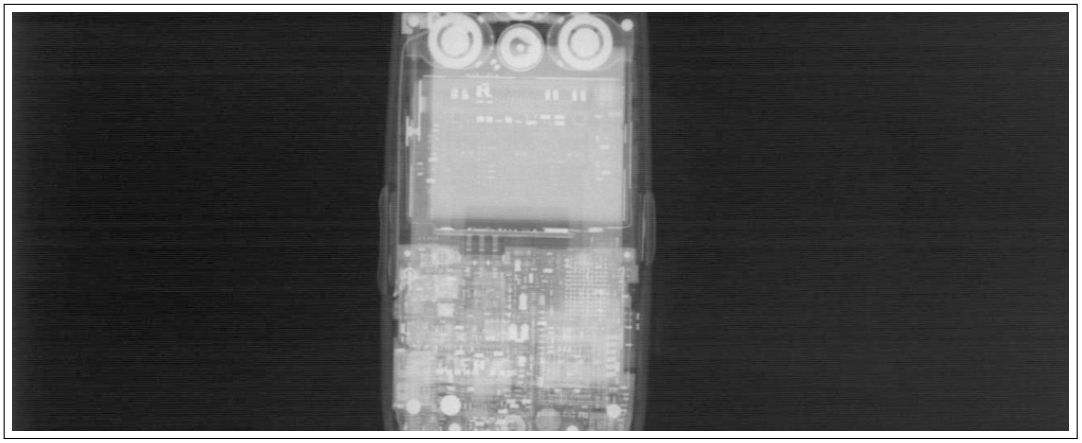


Symptom: Honeycomb/hexagonal pattern throughout the image.

Cause: Exposing a cassette up-side down.

Solution: First ensure that the cassette is erased, then re-expose the cassette with the carbon-fiber side facing up, then re-scan.

7.3.6 Grid Lines/Moiré Effect



Symptom: Grid lines/Moiré Effect

Cause: A grid with the wrong LPI, or a misoriented cassette under the grid.

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Solution: To alleviate grid lines/ moiré effect, first ensure that the grid being used is 178 LPI. If the grid in use is 178 LPI, then rotate the cassette 90° under the grid.

7.3.7 Eraser Offset

Symptom: A gap of white space between the edge of the image and the physical edge of the cassette after scanning.

Cause: Eraser offset needs to be increased or decreased.

Solution:

1. Open XSCAN32.
2. Create/edit a patient, then click **Save & View**.
3. Click the **Scan** button (if it is a patient with no images, the Scan interface will automatically open).
4. Click the **Settings** button, then enter the password *earl* (case sensitive).
5. Locate the setting for Eraser Offset.
6. The user may need to adjust this setting several times before achieving the desired result. Expose a couple of cassettes, then scan and adjust the Eraser Offset until the image is acceptable.

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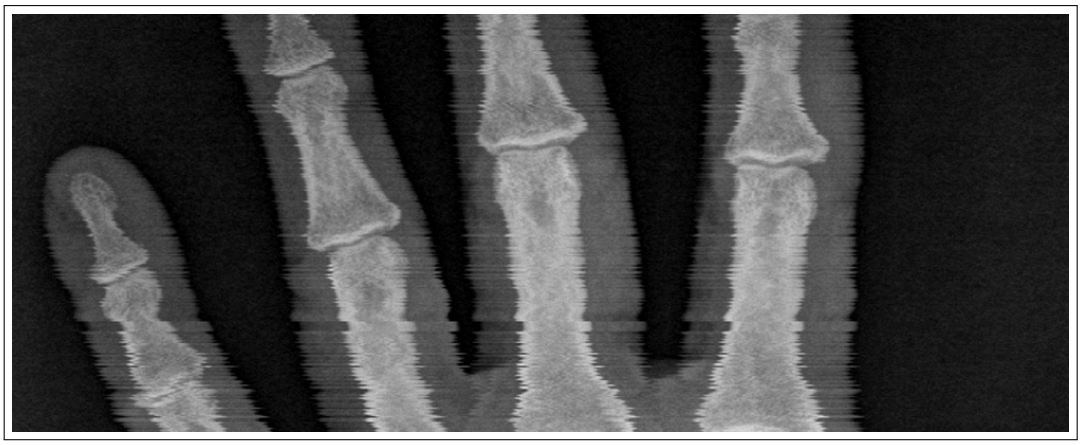
7.3.8 Image Jitter



Symptom: Jittery image.

Cause: Inconsistency in the CR unit's galvanometer.

Solution: Image jitter issues are **not** serviceable in the field. Please contact Technical Support for assistance with image jitter.

7.3.9 Over Exposure

Symptom: Lines in images / images look more "translucent"– the images lack the proper contrast and density.

Cause: Over exposure.

Solution: Make an exposure using your current exposure settings. Scan and evaluate the image. Then, reduce the exposure parameters, expose another plate, then scan and evaluate the image. Compare the results of both exposures, then adjust the "standard" exposure accordingly.

7.3.10 Random Imaging Shifting

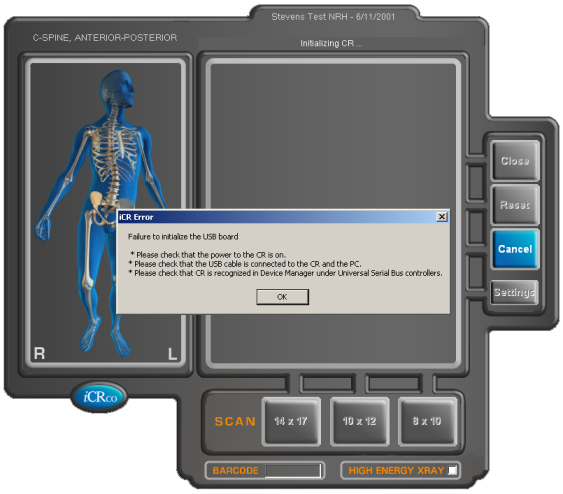
Symptom: Random Image Shifting.

Cause: Bad USB 2.0 connection.

Solution: Visually inspect the USB 2.0 cable connecting the CR unit to the computer. Make sure there are no visible cuts, freys or other damage. Move the USB 2.0 cable to a different USB port on the computer. If the problem persists, try swapping out the USB 2.0 cable for a new one.

7.4 Hardware Symptoms

7.4.1 Failure to Initialize USB



The *Failure to Initalize USB* error can be caused by several issues:

1. Make sure the CR unit is powered on.
2. Make sure the USB cable is firmly connected to both the CR unit and PC.
3. Visually inspect the USB cable for cuts or freys. The user may want to swap out the USB cable to ensure its integrity.

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4. Make sure the CR unit is recognized in the Windows Device Manager. Additionally, make sure the device drivers are properly installed. To do this:
   (a) Go to *Start* → *Control Panel* → *System* → *Hardware* → *Device Manager*
   (b) In the *Device Manager*, make sure there are no unrecognized USB devices.
   (c) In the *Universal Serial Bus* entry, the user should see an entry for the CR unit. If there is no entry, or there are yellow question marks in the Device Manager, please re-install the device drivers. If the user does not have the original installation CD containing the device drivers, please contact Technical Support.

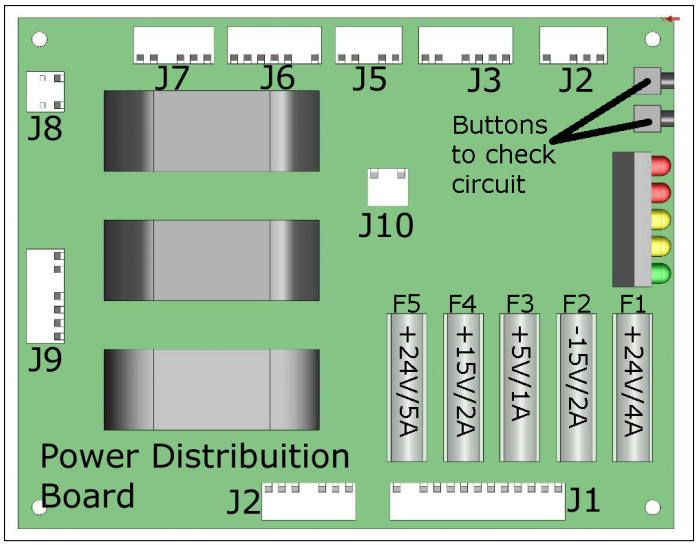
7.4.2 No Motor Movement

Symptom: When initiating a scan from the software interface, no sound is heard from the CR unit.

Cause: Bad fuses, motor controller, cable, or motor.

Solution:

1. Check the fuses as cover in Section 8.12.
2. If the fuses are not at fault, remove the back cover as covered in Section 8.2, and check that connectors J1, J2, J3, J4, J5, and J7 are firmly connected to their respective boards.



⚠ WARNING Do **not** operate the unit with the covers removed. Laser & LED lights may cause harm to the operator.

3. If the motor controller light is flashing or solid red, then the motor controller board will need to be replaced.

7.4.3 Clicking Noise Returning to Home

Symptom: Clicking noise heard from CR unit when returning to the home position.

Cause: At the end of the scan: Eraser offset.
At home position: Fuses / sensor.

Solution: At the end of the scan: Change eraser offset.
At home position: Check fuses as cover in Section 8.12. Check the Power Distribution board / Move sensor.

7.4.4 Not Finding Home Position

Symptom: The CR unit is not finding the home position.

Cause: Bad fuses, Power Distribution board, or Move sensor.

Solution: Check fuses as cover in Section 8.12. Check the Power Distribution board / Move sensor.

7.4.5 Motor Gear/Slide Lines

Symptom: Noises while scanning.

Cause: Bad slide / misaligned motor gear

Solution: Listen for noises while making a test scan. Leave the bay door open and watch the cassette to see if it bumps or shifts during the scan. If this is the case, the unit will either need to be realigned or have the slide repaired/replaced. Please contact Technical Support, as motor gear/slide issues are not serviceable in the field.

7.4.6 Cassette Door Stays Open

Symptom: Carbon fiber door will not stay closed.

Cause: Broken catch.

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Solution: A broken catch is not serviceable in the field. Please contact Technical Support for more information.

7.4.7 Cassette Stuck in CR unit

Symptom: Cassette stuck in CR unit.

Cause: Misloaded cassette / pressure from Caterpillar Brush.

Solution: Power cycle on & off CR unit, then hit **Reset** in the Scan interface. This should cause the cassette to come out of the eraser cover. If the problem persists, and it is verifiable that the cassette is being loaded correctly, then the Brush Bar Brush is putting too much pressure on the cassette. To fix this, decrease the Stage Velocity by five.

1. Open XSCAN32.
2. Create/edit a patient, then click **Save & View**.
3. Click the **Scan** button (if it is a patient with no images, the Scan interface will automatically open).
4. Click the **Settings** button, then enter the password *earl* (case sensitive).
5. Locate the entry for *Stage Velocity*, then decrease the current number by five.

7.5 Error Message: No Data Acquired

7.5.1 Failure Analysis 1

1. When turning on the CR, see if there is a pop-up message in the lower right hand corner of the Windows task bar stating "This USB device can perform faster if it is connected to a hi-speed USB 2.0 port." If so:
   - make sure the CR is plugged into a USB 2.0 port. Some older PCs only have USB 1.0 or 1.1 ports. These older variety of USB ports are **not** sufficient in speed to acquire data from the CR unit.
   - make sure the BIOS does not have any options set for conserving power (especially on laptops). Sometimes the PC will not run the USB ports at their full potential to save power. Please consult the PC's user manual for more information.
   - try unplugging the USB cable from the CR unit and then plugging it back in. If the message does not appear try to scan. In some instances, turning the CR unit on with the USB cable plugged in causes Windows to recognize the device

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as USB 1.0. In some instances, unplugging and replugging the USB cable can correct this.

2. After clicking on the scan button, listen for the motor and see if the CR slide moves at all. If it does not move at all, then the motor controller board may be at fault.
   - open the back of the CR unit (see Section 8.2 for instructions) and locate the motor controller board on the lower left. The motor has cables directly connected to the board.
   - look for either a red or green indicator light on the board. It may be covered by silicone, which can be removed.
   - a green light on the motor controller board indicates that the board is in working condition, while a red light indicates a faulty board that will need to be replaced. If the board needs replacement, please contact Technical Support.
3. Check the following:
   - check the fuses on the power distribution board (see Section 8.12 for instructions)
   - check that the laser and eraser lights turn on: With the slide away from the home position, see if the laser turns on (full beam from top to bottom). The laser beam must also overlap the trigger board behind the long mirror.
   - if the laser does not turn on, check if the galvo mirror oscillates.
   - if the galvo is on and the laser is not, wiggle the cable coming from the laser body to see if the laser turns on.
   - follow the cable to the laser connector on the PMT board and make sure it is not loose. Unplug and replug the connector.

     Note the slide must be away from the home position fro the laser to turn on.
   - if the galvo does not turn on, check the galvo cables. Wiggle them, then unplug and replug the connectors.
4. If the galvo does not turn on, the galvo or PMT board may need to be replaced. If the galvo turns on the but the laser does not, replace or repair the laser

7.5.2 Failure Analysis 2

Note Failure possibilities are listed in order or likelihood.

Fault: Laser trigger pulses are not being received by XSCAN32.

Assumptions: In order for the CR unit to arrive at this point:

- The CR unit is powered up and communicating via the USB to the XSCAN32 software.

- Motor movement and magnet/reed switch are most likely functional as RETURN TO HOME followed by START SCAN commands operate without apparent error. These commands are executed prior to expecting laser triggers.

Setup:

1. Power off the CR unit.
2. Remove back cover (see Section 8.2 for instructions) and back optical cover (see step 3 from Section 8.11 for instructions).
3. Switch **off** PMT board hi-voltage by switching the one red switch on the PMT board inward, towards the center of the PCBA.
4. Power on the CR unit.
5. Press and hold the two Power Distribution board push-button switches. If all five Diagnositc LEDs do **not** brightly illuminate, stop! Possible failures include:
   - Power Distribution fuses are blown (see Section 8.12 for instructions)
     ⚠ CAUTION If fuse(s) are found to be bad and replacement fuse(s) continue to blow, **STOP**! A potentially dangerous electrical situation may exit and the CR unit should be returned to the factory for repair.
   - Bad Power Distribution board or cabling.
   - Bad +24V Power Supply or cabling
   - Bad Quad Power Supply or cabling
   - If a fix has not been accomplished by this point, the machine should be returned to the factory for repair.
6. Turn the slide motor shaft by hand until the slide is observed to be well away from the HOME position.

Checks:

1. If the Eraser LEDs do **not** illuminate, **STOP**! Possible failures:
   - If eraser lights are switch-able, then verify the eraser switch is in the ON position.
   - Power Distribution fuse(s) has blown.
     ⚠ CAUTION If fuse(s) are found to be bad and replacement fuse(s) continue to blow, **STOP**! A potentially dangerous electrical situation may exit and the CR unit should be returned to the factory for repair.
   - Bad Power Distribution board or cabling
   - Bad +24V Power Supply or cabling
   - Bad Quad Power Supply or cabling
   - If a fix has not been accomplished by this point, the machine should be returned to the factory for repair.

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2. If the galvo mirror is **not** oscillating, **STOP**! Possible failures:
   - Bad PMT board or cabling
   - Bad Galvo/Controller or cabling
   - Bad Quad Power Supply or cabling
   - If a fix has not been accomplished by this point, the machine should be returned to the factory for repair.
3. If the Laser is **not** illuminated, **STOP**! Possible failures:
   - If the laser has an external power supply, check to verify that the programmable power setting is not set too low
   - Bad laser, laser/supply combo, or cabling
   - Bad PMT board or cabling
   - Bad Quad Power Supply or cabling
   - If a fix has not been accomplished by this point, the machine should be returned to the factory for repair.
4. Temporarily place a Post-it®or similarly light-colored paper behind the Trigger board. This enables viewing of the laser beam.
5. If the laser beam is **not** observed to OVERLAP the Trigger board, **STOP**! Possible failures:
   - Galvo AMP setting too low; try increasing AMP setting
   - Bad PMT board or cabling
   - Bad Galvanometer/Controller or cabling
   - Beam may require re-alignment. This alignment is accomplished by galvo adjustment and is beyond the scope of this failure analysis. Please contact Technical Support for further assistance.
   - If a fix has not been accomplished by this point, the machine should be returned to the factory for repair.
6. If the laser beam does **not** cross through the center of the trigger sensor, **STOP**! Possible failures:
   - Bad Trigger board
     Note The Trigger board cable is un-keyed and is therefore prone to misconnection.
   - Bad PMT board or cabling, specifically the TILO cable
   - Bad Quad Power Supply or cabling

If a fix has not been accomplished by this point, the machine should be returned to the factory for repair.

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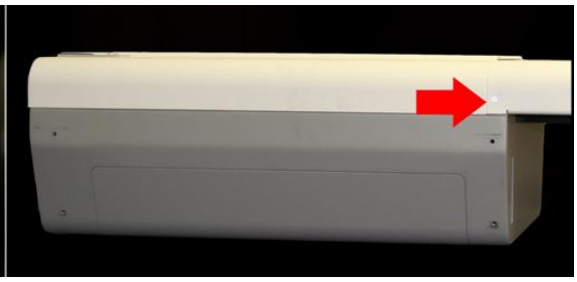
8. Service & Maintenance Procedures

8.1 Removing Front Cover

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Orient the CR unit on its back.
3. Remove four (4) 10-32 x $\frac{1}{2}$" panhead screws from the feet.

4. Remove four (4) 6-32 x $\frac{3}{8}$" flathead screws from the front cover.



5. Slide the top cover back, then lift the cover off.

6. Remove four (4) 6-32 x $\frac{1}{4}$" screws from the bottom door assembly.

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7. Remove the brass pin & clip from the gas spring assembly.
8. Remove the door.

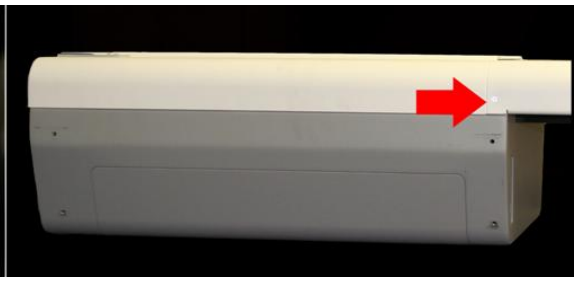
8.2 Removing Back Cover

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Remove seven (7) 6-32 x $\frac{3}{8}$" flathead undercut screws from the back cover.
3. Gently pull the back cover away from the CR unit.

8.3 Accessing the Scan Slot

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Orient the CR unit on its back.
3. Remove four (4) 10-32 x $\frac{1}{2}$" panhead screws from the feet.

4. Remove four (4) 6-32 x $\frac{3}{8}$" flathead screws from the front cover.



5. Slide the top cover back, then lift the cover off.

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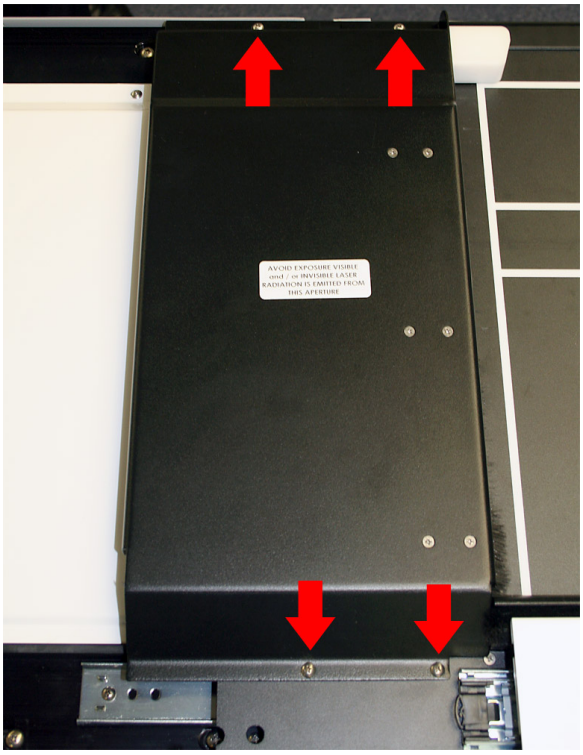
6. Remove four (4) 6-32 x $\frac{1}{4}$″ screws from the bottom door assembly.
7. Remove the brass pin & clip from the gas spring assembly.
8. Remove the door.
9. Remove two (2) 6-32 x $\frac{1}{2}$″ & two (2) 6-32 x 1″ flat head screws from the brush bar cover.



10. The scan slot is located under the brush bar cover.

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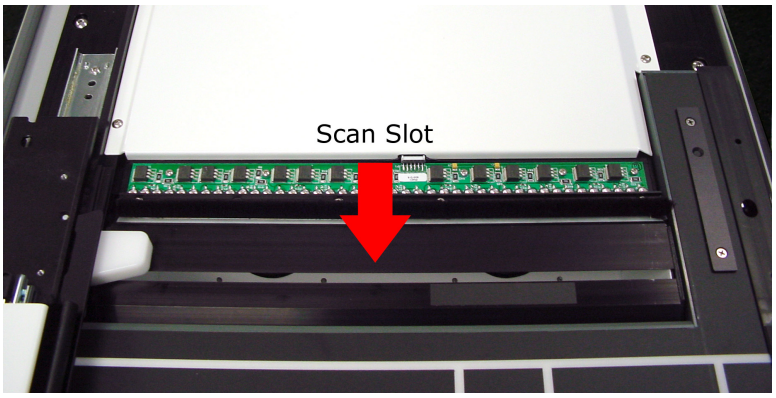

8.4 Replacing the PMT Board

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Remove seven (7) 6-32 x $\frac{3}{8}$" flathead undercut screws from the back cover.
3. Gently pull the back cover away from the CR unit.
4. Remove eight (8) 4-40 x $\frac{1}{4}$" truss head screws from the back optical cover.
5. Remove the USB, phone jack and four (4) power connectors from the PMT board.
6. Remove six (6) 4-40 x $\frac{1}{2}$" screws from the PMT board.
7. Ease the PMT board from the PMT Tube contacts.
8. The PMT board is now free and can be removed.

8.5 Removing the Optical/Electrical Module from the Case

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Remove seven (7) 6-32 x $\frac{3}{8}$" flathead undercut screws from the back cover.
3. Remove the internal USB connector from its external connection, the power switch plugs from the main power supply and the eraser power supply, and the external fan power plug.
4. Orient the CR unit on its back.
5. Remove four (4) 10-32 x $\frac{1}{2}$" pan head screws from the feet.

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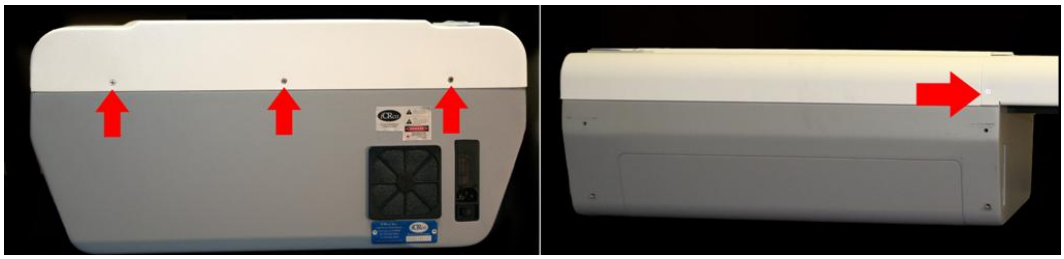
6. Remove four (4) 6-32 x $\frac{3}{8}$" flathead screws from the front cover.



7. Slide the top cover back, then lift the cover off.

8. Remove four (4) 6-32 x $\frac{1}{4}$" screws from the bottom door assembly.
9. Remove the brass pin & clip from the gas spring assembly.
10. Remove the door.
11. Remove two (2) 6-32 x $\frac{1}{2}$" & two (2) 6-32 x 1" flat head from the brush bar cover.

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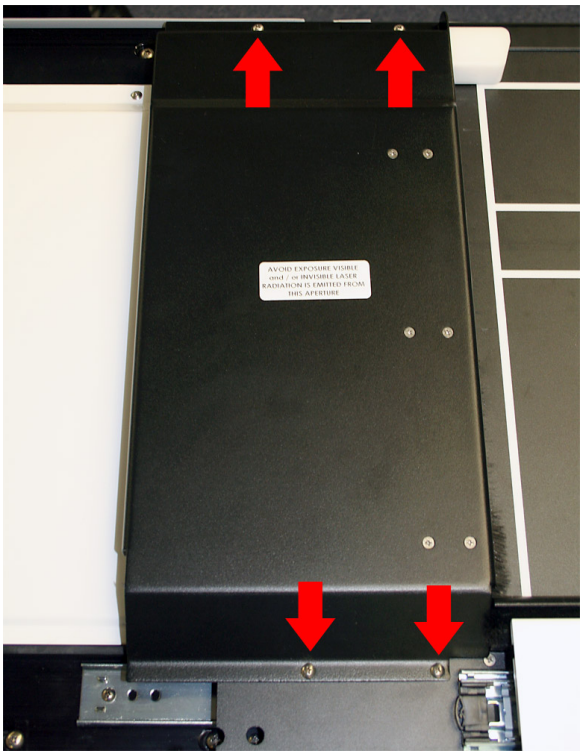
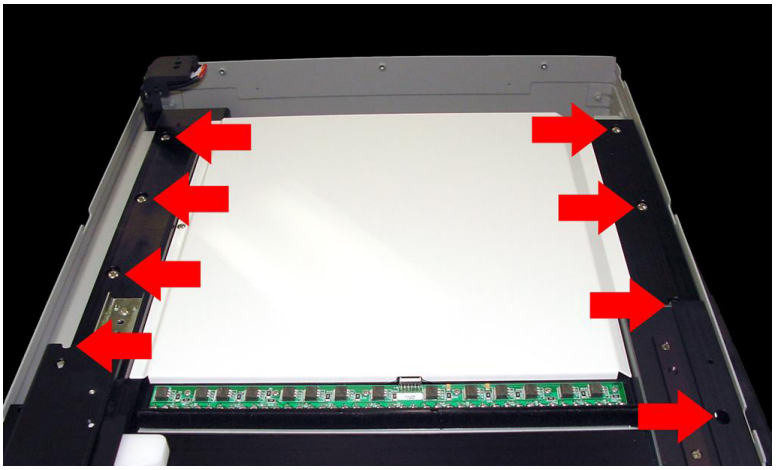


12. Add masking tape over the Scan Slot to minimize dust entry into the system.
13. Remove eight (8) 10-32 x $\frac{3}{4}$"screws from the chasis.

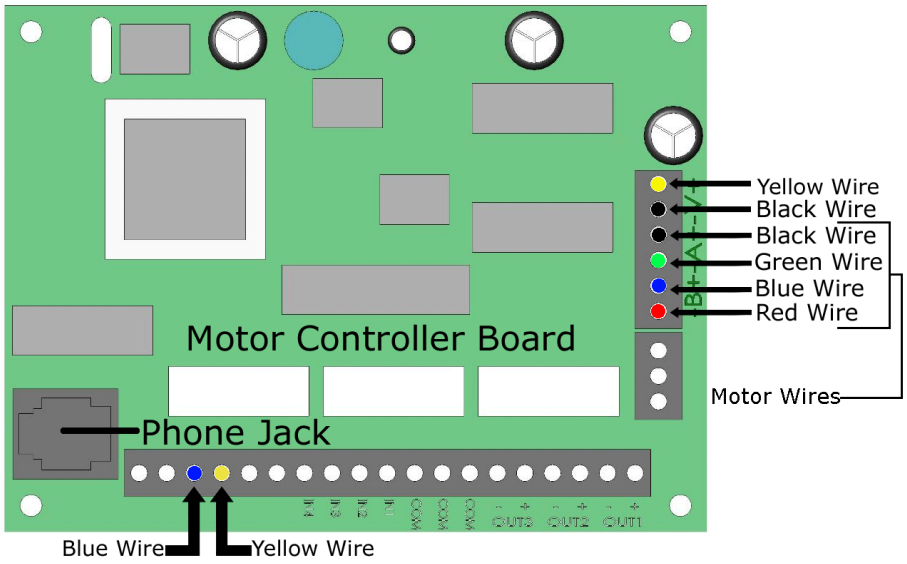


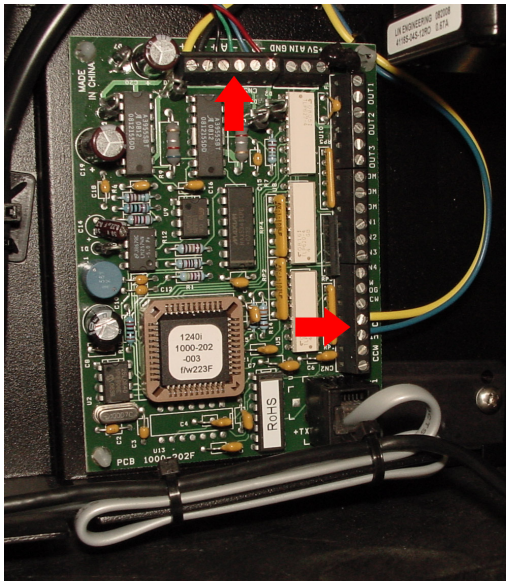
14. With two (2) or more people, lift the module out of the outer shell.

8.6 Replacing the Motor Controller Board

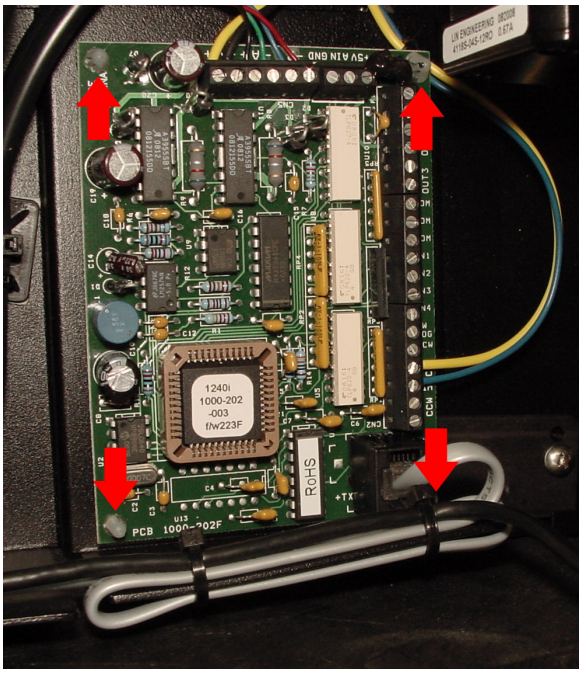
1. Remove the module from the case, as covered in Section 8.5 on page 46.

2. Using a small flathead screw driver, unscrew the wires from the Motor Controller board.





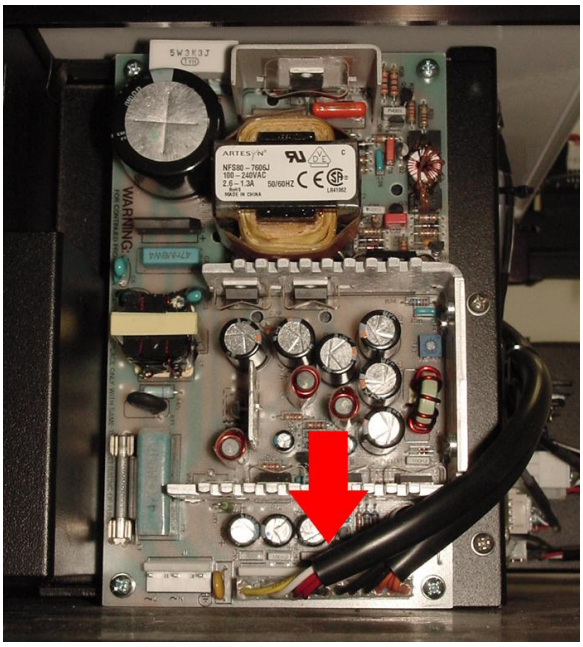
3. Remove the phone cord from the Motor Controller board.
4. Using a pair of needle nose pliers, pinch each of the four (4) fasteners, freeing the Motor Controller board.



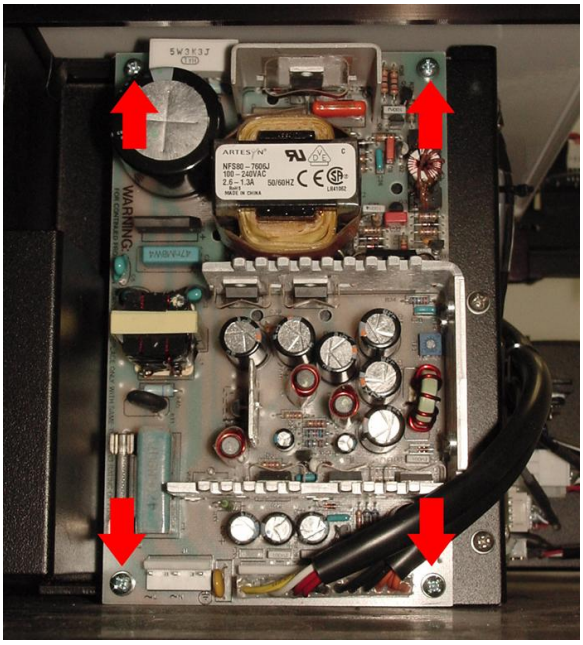
5. Remove the Motor Controller board from the CR unit.
6. Replace the Motor Controller board, then reassemble the CR unit in the reverse order from taking it apart.

8.7 Replacing the Main Power Supply

1. Remove the module from the case, as covered in Section 8.5 on page 46.
2. Unplug the power connectors from the board.



3. Unscrew four (4) 6-32 x $\frac{3}{8}$" screws from the Main Power Supply.



4. Remove the Main Power Supply from the CR unit.
5. Replace the Main Power Supply, then reassemble the CR unit in the reverse order from taking it apart.

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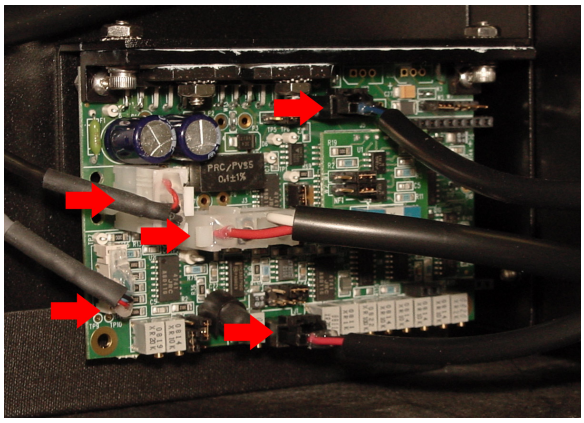
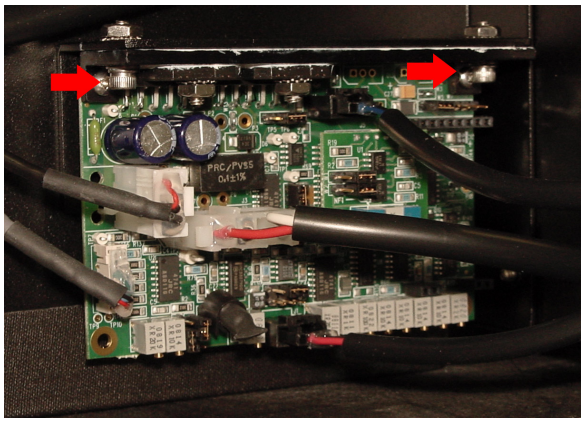
8.8 Replacing the Galvo Controller Board

1. Remove the module from the case, as covered in Section 8.5 on page 46.
2. Remove the connectors from the board.



3. Remove two (2) 6-32 x $\frac{1}{4}$ truss head screws from the Galvo Controller board.



4. Remove the Galvo Controller board from the CR unit.
5. Replace the Galvo Controller board, then reassemble the CR unit in the reverse order from taking it apart.

8.9 Replacing the Power Distribution Board

1. Remove the module from the case, as covered in Section 8.5 on page 46.
2. Remove all of the connectors from the Power Distribution board (cut the zip ties holding the cables in place if necessary).
3. Remove four (4) 6-32 x $\frac{3}{8}$" screws, washer, and lock washer from the Power Distribution board.

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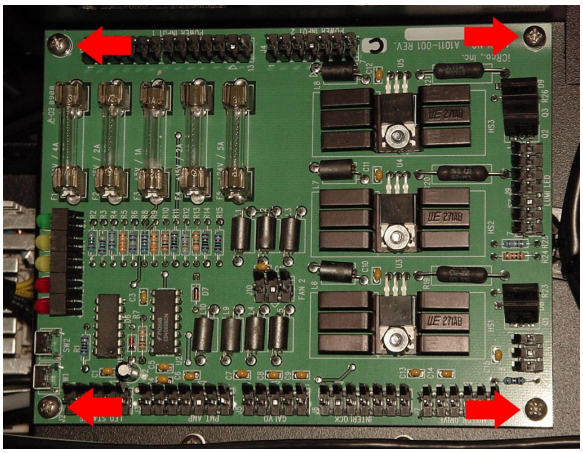
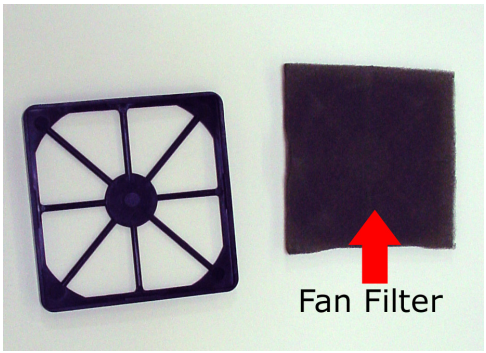


4. Remove the Power Distribution board from the CR unit.
5. Replace the Power Distribution board, then reassemble the CR unit in the reverse order from taking it apart.

8.10 Cleaning the Fan Filter

1. With a small, flathead screwdriver, gently pry the fan filter housing away from the machine. It should pop off with minimal force.

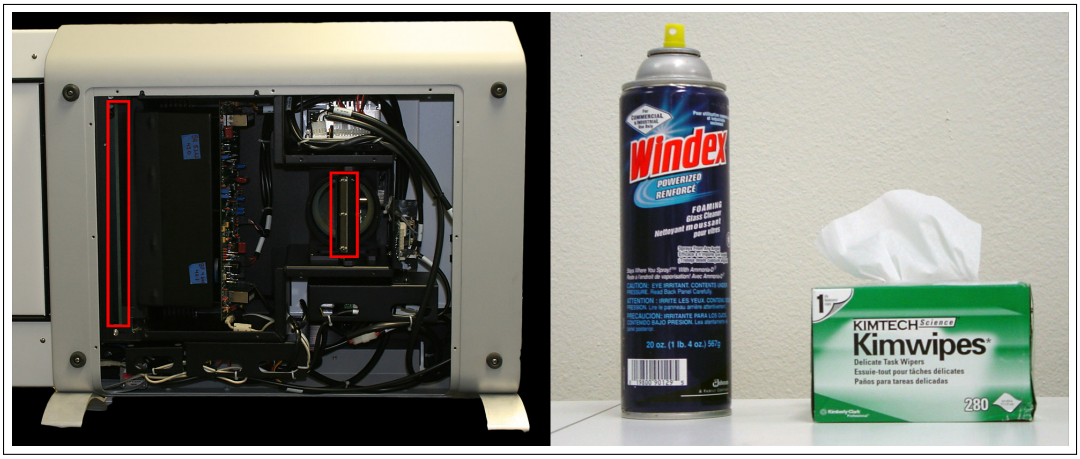
2. Remove the fan filter.



3. To clean the filter, wash throughly in warm water, then air dry the filter over night.

8.11 Cleaning the Mirrors

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Remove the back cover, as covered in Section 8.2.
3. Remove eight (8) 4-40 x $\frac{1}{4}$" truss head screws & lock washers from the back optical cover.
4. Locate the mirrors.



5. Apply the glass cleaner on the soft, lint-free tissue. Do not put cleaner directly on the mirrors. Clean the mirrors in a circular motion and do not apply much force. Use a flashlight to make sure that there are no dust particles or smearing residue on mirrors.

8.12 Checking the Fuses

8.12.1 Power Fuses

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. With a small screwdriver, gently pry off the protective flap.

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3. Gently removed the fuse housing.

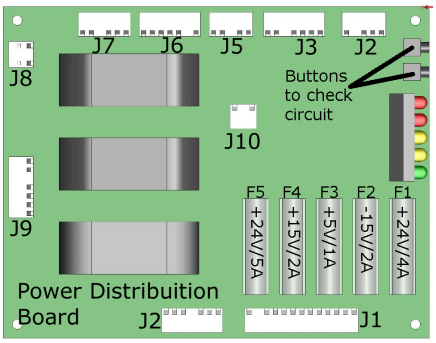
4. The fuses are located on the back of the fuse housing.

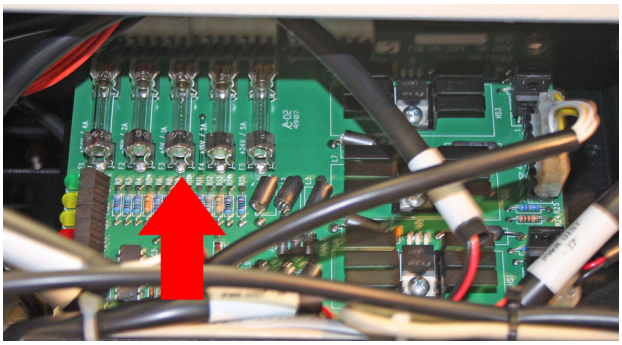
5. The fuses are 3A/250V.

8.12.2 Power Distribution Board Fuses

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Remove the front cover, as covered in Section 8.1.

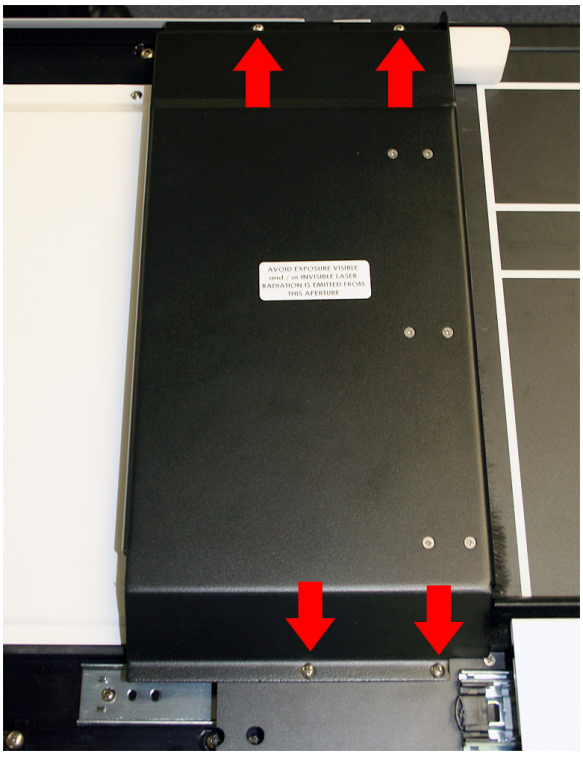
3. There are five fuses located on the power distribution board. Remove & check them:





8.13 Changing the Brushes

1. Make sure the CR unit is powered off. Remove the power cord from the unit.
2. Remove the front cover, as covered in Section 8.1.
3. Remove two (2) 6-32 x $\frac{1}{2}$" & two (2) 6-32 x 1" truss head from the brush bar cover.



4. Apply masking tape over the scan slot to minimize dust entry.
5. The user now has access to the Caterpillar and Brush Bar Brushes.

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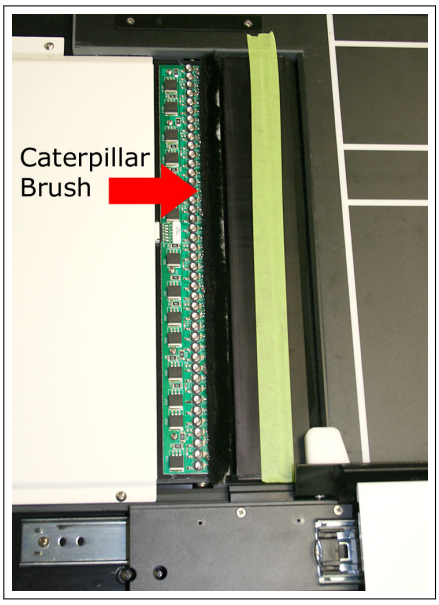
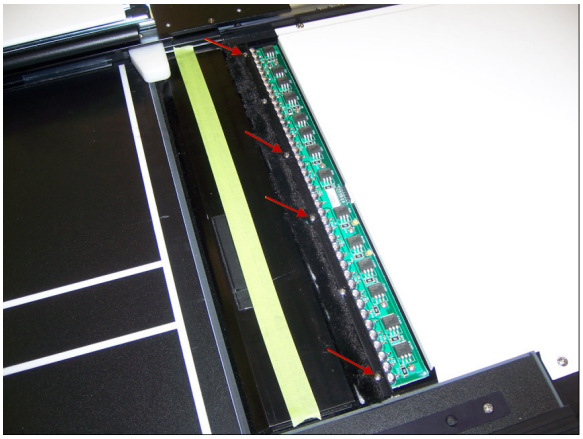
8.13.1 Caterpillar Brush

The Caterpillar brush is located next to the eraser lights.



1. To remove the Caterpillar Brush, ensure that there are no brush clips holding it down.
2. If there are brush clips, remove the four (4) 4-40 x $\frac{3}{8}$" or $\frac{1}{2}$" (depending on the CR model) panhead screws from the light bar.



3. Pull the Caterpillar Brush from the light bar.
4. Using a finger, rub away any extra adhesive from the light bar.
5. Remove the double-sided tape from the new Caterpillar Brush.
6. Apply the new Caterpillar Brush in the same position as the old one. Ensure that the brush goes on smooth, as bumps in the brush may cause cassette bumps.

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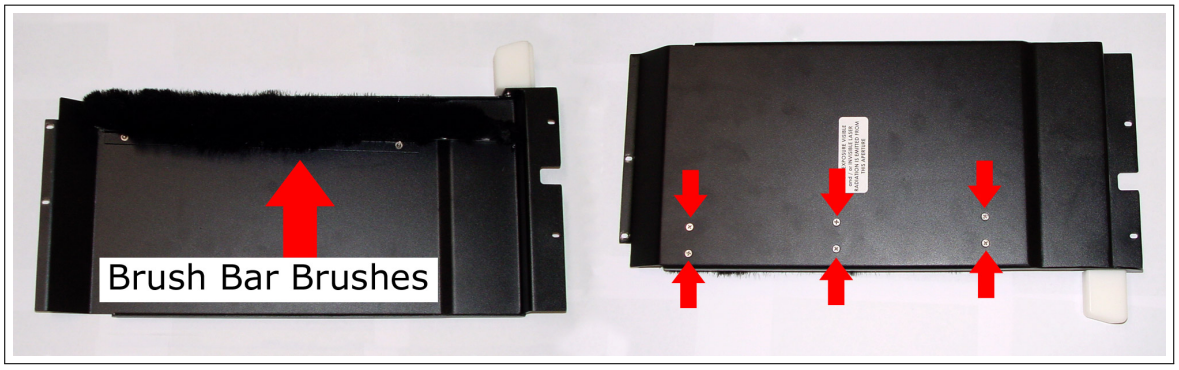
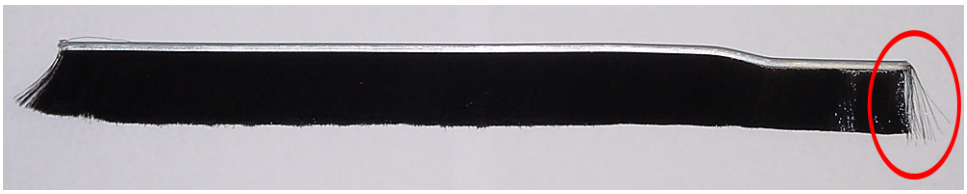
8.13.2 Brush Bar Brushes

The Brush Bar Brushes are located on the back side of the brush bar.

1. To remove the Brush Bar Brushes, remove six (6) 6-32 x $\frac{1}{4}$" flathead undercut screws from the Brush Bar.



2. Slide the old brush out of its holder.
3. Trim any stray brush hairs from the new brush using a razor blade.



4. Slide the new brush into the holder.
5. Apply a dab of E-6000/Goop/UHU or equivalent clear gel glue (non-silicone) adhesive to the non-bent side of the brush.

6. Screw the brush holder back into the Brush Bar.

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